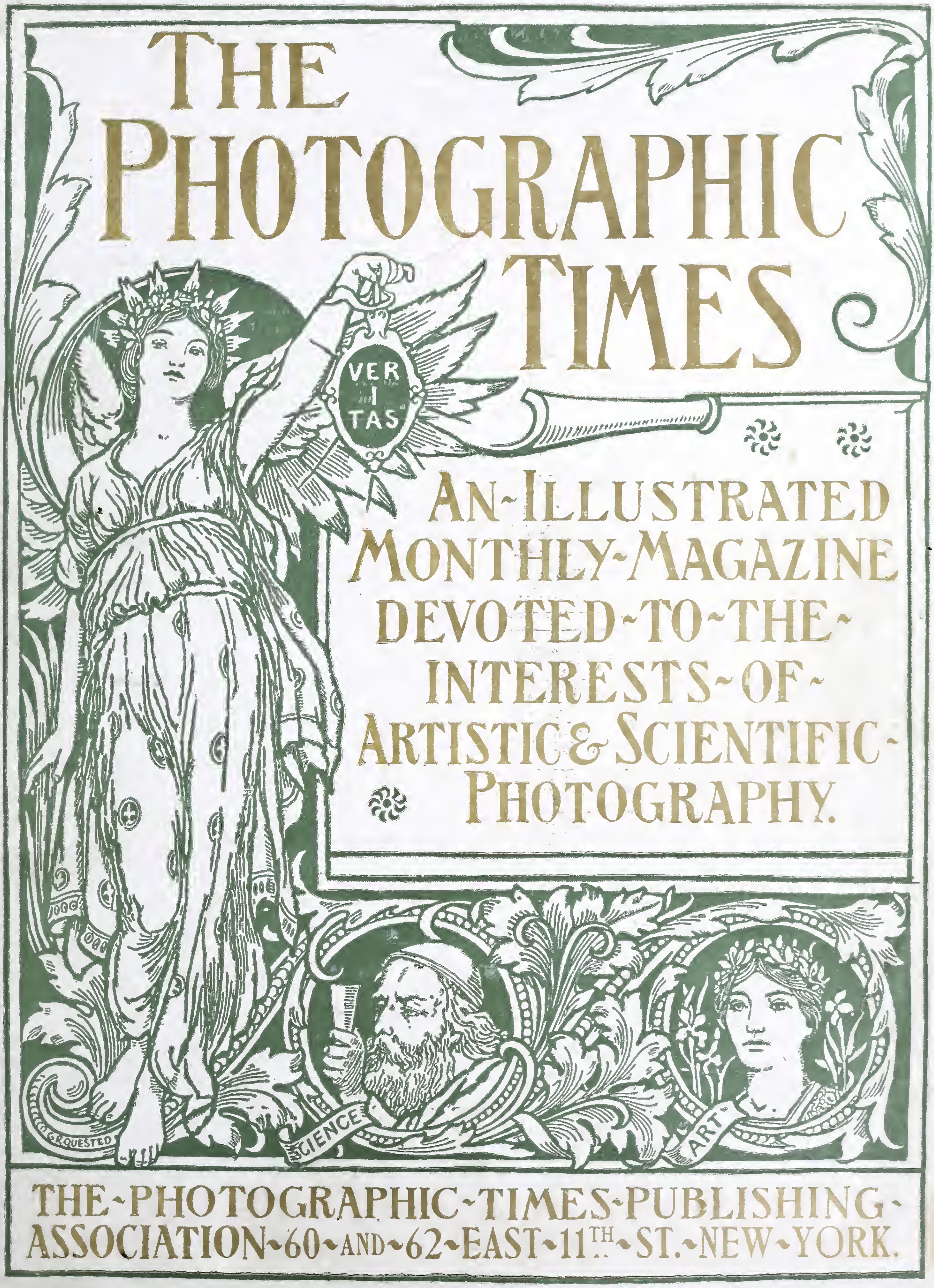
HOLIDAY NUMBER.
Vol. XXIX. JANUARY, 1897. Number 1.
FOUR DOLLARS PER ANNUM. SINGLE COPIES, 35 CENTS



THE PHOTOGRAPHIC TIMES

AN ILLUSTRATED MONTHLY MAGAZINE DEVOTED TO THE INTERESTS OF ARTISTIC & SCIENTIFIC PHOTOGRAPHY.

THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION 60 AND 62 EAST 11TH. ST. NEW YORK.

THIS ISSUE COMMENCES A NEW VOLUME.

CONTENTS.

PAGE
Frontispiece—"The Village Choir"—By John E. Dumont.
The Unphotographic Photograph—Illustrated—By E. Lee Ferguson ... 1
The Two Chief Photographic Exhibitions of the Year. I.—The Royal—Illustrated—By Hector Maclean, F.G.S., F.R.P.S. ... 3
Binocular Vision—By Geo. A. Sawyer, U.S.N. ... 11
Eikonogen By John J. Higgins, A.M., M.D. ... 12
"The Beginning of the End"—By J. de Bruyn Kops ... 12
Cycle and Camera—By Dr. Hugo Erichsen ... 13
"I Have a Little Cat and I'm Very Proud of That"—By E. Lee Ferguson ... 13
Relation of Photography to Designing—Illustrated—By Pruella Janet Sherman ... 14
Examination of Cathode and Roentgen X-Rays Through Colored Screens with the Fluoroscope—By John Carbutt ... 21
A New Resort—Illustrated—By R. Henry Scadin ... 22
Neglected Opportunities—By Frederic Felix ... 23
Tyag; or, The Renunciation—Illustrated—By Shapoor N. Bhedwar ... 25
Effective Aperture of Lenses for Near Objects—Illustrated—By Wm. A. Haren ... 29
Tuning Forks Photographically Applied to the Measurement of Minute Intervals of Time—Illustrated—By Albert C. Crehore and George O. Squier ... 30
PAGE
"Landscape"—By H. Troth ... 32
Orthochromatic Photography—By Milton B. Punnett 32
"Spring Time"—By The Carbon Studio. .Opp. page 32
Sharp Focus, and Other Matters—By A. Horsley Hinton ... 33
Naturalistic Photography—By P. H. Emerson, B.A., M.B. (Cantab) ... 38
"Marshy Meadows"—By H. Troth ... 41
Digressions. The Picturesque and the Beautiful—By H. P. Robinson ... 41
Editorial Notes—Illustrated ... 44
Napoleon Sarony—Illustrated ... 51
The Confession of a Camera Fiend ... 52
Hochstadter's Formula for Platinum Developer ... 54
Intensifying, Reducing and Toning Slides—By E. J. Wall ... 54
"The Alchemist"—By Fred. Boissonas ... 55
Notes ... 56
On the Color of Negatives as Influencing the Prints from Them—By W. K. Burton ... 61
Trade Notes ... 62
Notes about Photographers—Illustrated ... 62
Editorial Table ... 63
"The Ferry"—By E. Mainwaring ... 63
Photographic Patents ... 64
THE ENCYCLOPÆDIC DICTIONARY OF PHOTOGRAPHY ... 193

Digitized by the Internet Archive
in 2017 with funding from
Getty Research Institute

Sweetheart Adhesive = Cloth = = =

A Support for Photographic Prints,

Ready Prepared for Mounting.

A photograph mounted on this cloth can be folded and crumpled without cracking, or even creasing, the coated surface of the paper.

SEND FOR FULL PARTICULARS TO:

The Scovill & Adams Co. of New York,

60 and 62 East 11th Street, New York.

ASK YOUR DEALER FOR IT.

https://archive.org/details/photographictime2930unse

THE GETTY CENTER
LIBRARY

The Entire Edition is already nearly exhausted,
HAVE YOU SECURED A COPY?

The American Annual
of Photography and
Photographic Times
Almanac for 1897

EDITED BY WALTER E. WOODBURY.

70
full-page
Illustrations.

300
Pictures
in all.

1 Photogravure Frontispiece.
3 Three-Color Pictures.
1 Heliotype Reproduction.
1 Two-Color Print.
16 Inserts Printed in Colors.

ECLIPSES THEM ALL.

A Giant in size, and a veritable storehouse of good things.

Price, in Paper Covers,	$0 75
" Cloth Bound,	1 25
Additional for Postage,	17

FOR SALE BY
The Scovill & Adams Co. of N. Y.
60 and 62 East 11th Street.

A SEASONABLE NEW YEAR'S GIFT.

The S. & A. Photographic Series.

	Price per copy.
No. 1. **The Photographic Amateur.** By J. TRAILL TAYLOR. A Guide to the Young Photographer, either Professional or Amateur. (Second Edition.) Paper covers, 50 cents. Cloth bound (Library Edition)...	$0 75
No. 5. **Photography with Emulsions.** By CAPT. W. DE W. ABNEY, R.E., F.R.S. A treatise on the theory and practical working of Gelatine and Collodion Emulsion Processes. (Second Edition.) Paper covers	75
No. 7. **The Modern Practice of Retouching.** As practiced by M. Piquepé, and other celebrated experts. (Ninth Edition.) Paper Covers............	50
Cloth bound (Library Edition)............	75
No. 8. **The Spanish Edition of How to Make Pictures.** Ligeras Lecciones sobre Fotografia Dedicados a Los Aficionados. Cloth bound, 75 cents. Paper covers............	50
No. 12. **Hardwich's Photographic Chemistry.** A manual of photographic chemistry, theoretical and practical. Ninth Edition. Edited by J. TRAILL TAYLOR. Leatherette binding............	2 00
No. 13. **Twelve Elementary Lessons on Silver Printing.** (Second Edition.) Paper covers........	50
No. 14. **About Photography and Photographers.** A series of interesting essays for the studio and study, to which is added European Rambles with a Camera. By H. BADEN PRITCHARD, F.C.S. Paper covers	50
Cloth bound (Library Edition)............	75
No. 15. **The Chemical Effect of the Spectrum.** By Dr. J. M. EDER. Cloth bound, 50 cents. Paper covers,	25
No. 16. **Picture Making by Photography.** By H. P. ROBINSON. Author of Pictorial Effect in Photography. Written in popular form and finely illustrated. Library Edition, $1.00. Paper Covers........	75
No. 20. **Dry Plate Making for Amateurs.** By GEORGE L. SINCLAIR, M.D. Pointed, practical and plain. Leatherette binding............	50
No. 21. **The American Annual of Photography and Photographic Times Almanac for 1887.** (Second Edition.) Paper cover; (postage, 12 cents additional)............	50
Library Edition; (postage, 12 cents additional)............	1 00
No. 22. **Photographic Printing Methods.** By the Rev. W. H. BURBANK. A Practical Guide to the Professional and Amateur Worker. Cloth bound. (Third Edition)............	1 00
No. 23. **A History of Photography.** Written as a practical guide and an introduction to its latest developments. By W. JEROME HARRISON, F.G.S., and containing a frontispiece of the author. Cloth bound............	1 00
No. 24. **The American Annual of Photography and Photographic Times Almanac for 1888.** Illustrated. (Second Edition.) Paper; (by mail, 12 cents additional.)............	50
Library Edition; (by mail, 12 cents additional)............	1 00
No. 25. **The Photographic Negative.** A Practical Guide to the Preparation of Sensitive Surfaces by the Calotype, Albumen, Collodion, and Gelatine Processes, on Glass and Paper, with Supplementary Chapter on Development, etc., by the REV. W. H. BURBANK. Cloth bound. Reduced from $1.50 to............	1 00
No. 26. **The Photographic Instructor for the Professional and Amateur.** Being the comprehensive series of Practical Lessons issued to the Students of the Chautauqua School of Photography. Revised and enlarged. Edited by W. I. LINCOLN ADAMS, with an Appendix by Prof. CHARLES EHRMANN. (Fifth Edition, enlarged and revised.) Paper Covers $1.00. Library Edition............	1 50
No. 27. **Letters on Landscape Photography.** By H. P. ROBINSON. Finely illustrated from the Author's own photographs and containing a Photogravure Frontispiece of the Author. Cloth bound............	1 50
No. 29. **The Processes of Pure Photography.** By W. K. BURTON and ANDREW PRINGLE. A standard work, very complete and freely illustrated. Price, in paper covers, $2.00. Library Edition............	2 50
No. 30. **Pictorial Effect in Photography.** By H. P. ROBINSON. A new edition. Illustrated. Mr. Robinson's first and best work. Cloth bound............	1 50
No. 32. **Practical Photo-Micrography.** By ANDREW PRINGLE. Fully illustrated. Cloth bound......	$2 50

The S. & A. Photographic Series.

(Continued.)

	Price per copy.
No. 33. **The American Annual of Photography and Photographic Times Almanac for 1890.**	
Paper cover (by mail, 14 cents additional)	50
Library Edition (by mail, 14 cents additional)	1 00
No. 34. **The Optical Lantern.** Illustrated. By ANDREW PRINGLE. In paper covers	1 00
Cloth bound	1 50
No. 35. **Lantern-Slides by Photographic Methods.** By ANDREW PRINGLE. In paper covers	75
Cloth bound	1 25
No. 36. **The American Annual of Photography and Photographic Times Almanac for 1891.**	
Paper cover (by mail, 15 cents additional)	50
Library Edition (by mail, 15 cents additional)	1 00
Cyclopedic Index for 1891 Annual	10
No. 37. **Photographic Optics.** A Text Book for the Professional and Amateur. By W. K. BURTON. Paper	1 00
Library Edition	1 50
No. 38.—**Photographic Reproduction Processes.** Illustrated. By P. C. DUCHOCHOIS. Paper	1 00
Cloth	1 50
No. 39. **El Instructor Fotografico.** Paper covers, $1.00 Library edition	1 50
No. 41. **The Chemistry of Photography.** By W. JEROME HARRISON. Cloth bound	3 00
No. 42. **Picture-Making in the Studio.** By H. P. ROBINSON. Paper	50
Cloth bound (Library edition)	1 00
No. 43. **The American Annual of Photography and Photographic Times Almanac for 1893.**	
In Paper covers. Postage, 15 cents extra	50
Cloth bound (Library edition). Postage 15 cents extra	1 00
No. 44. **The Lighting in the Photographic Studio.** By P. C. DUCHOCHOIS. A new edition. In paper covers	75
Cloth bound (Library edition)	1 00
No. 45. **The Grammar of Photo-Engraving.** By H. D. FARQUHAR. Illustrated. The most complete text book yet published on this subject. Price, in paper covers	2 00
Cloth bound (Library edition)	2 50
No. 46. **Industrial Photography.** Illustrated. By P. C. DUCHOCHOIS. Being a description of the various processes of producing Indestructible Photographic Images on Glass, Porcelain, Metal, and many other substances. Paper Covers, 50 cents. Cloth bound	1 00
No. 47. **The American Annual of Photography and Photographic Times Almanac for 1894.**	
Edited by W. I. LINCOLN ADAMS. In Paper Covers. Postage, 15 cents extra	50
Cloth bound (Library Edition). Postage, 15 cents extra	1 00
No. 48. **Aristotypes, and How to Make Them.** Giving a complete description of the manufacture and treatment of Gelatino and Collodio-Chloride Papers. By WALTER E. WOODBURY. Illustrated In Paper Covers	1 50
Cloth bound (Library edition)	2 00
No. 49. **The Encyclopedic Dictionary of Photography.** Containing over 2,000 references and about 400 illustrations. By WALTER E. WOODBURY, Editor of THE PHOTOGRAPHIC TIMES. In press.	
No. 50. **The American Annual of Photography and Photographic Times Almanac for 1895.**	
With over 200 illustrations. Edited by WALTER E. WOODBURY, Editor of "The Photographic Times." In Paper Covers. Postage, 15 cents extra	50
Cloth bound (Library Edition)	1 00
No. 51. **The Photo-Gravure.** By HENRY R. BLANEY. A very complete and practical book, written by an Expert. In paper covers, 50 cents. Cloth bound (Library edition)	1 00
No. 52. **The Platinotype: Its Preparation and Manipulation.** By Capt. W. DE W. ABNEY & LYONEL CLARK. Fully illustrated. 174 pages	1 25
No. 53. **The Annual, '96.** "The American Annual of Photography and Photographic Times Almanac for 1896," with 400 illustrations. Edited by WALTER E. WOODBURY, Editor of THE PHOTOGRAPHIC TIMES. In paper cover, 75 cents; in cloth bound	1 25
No. 54. **Half-Tone by the Enamel Process.** By ROBERT WHITTET. Fully illustrated and very complete. Price, in pape cover, 50 cents. Library edition	1 00
No. 55. **Instantaneous Photography.** By Capt. Abney, the great authority. Price in paper covers	75

For sale by all dealers in Photographic goods, booksellers, and sent, postpaid, on receipt of price, by the publishers.

No. 56. **Photographic Amusements.** By WALTER E. WOODBURY, Editor of THE PHOTOGRAPHSC TIMES In paper covers, $100. Cloth	1 50

THE SCOVILL & ADAMS CO. OF NEW YORK,

Send for new Book Catalogue. 60 and 62 East 11th Street, New York.

J. B. Lippincott Company's Special Spring Announcement.

A NEW ISSUE OF

Chambers's Encyclopædia

AT A POPULAR PRICE.

A Dictionary of Universal Knowledge, containing upwards of **30,000 articles;** illustrated by more than **3,500 engravings;** over **11,000,000 words,** and **17,560** columns of reading matter.

Rewritten and enlarged by American and English editors. International in character. Based upon the most recent census returns, and corrections and additions made up to the day of printing.

The New Popular Edition. In 10 volumes. Imperial Octavo.

Cloth binding, $20.00 net; half leather binding, $25.00 net.

CHAMBERS'S ENCYCLOPÆDIA is in use as a book of reference wherever the English language is known. The first edition of this great work was completed in 1868. From this point for over twenty years a process of correction and revision was continued from year to year, thus bringing the information down to the latest possible date.

But this process of revising and altering could not be carried on indefinitely. Many articles called for an entirely different treatment. New subjects of interest demanded admittance; while some have lost their claim to the prominence given them twenty-five years ago.

The Publishers, therefore, have set up and electrotyped the work afresh for this new edition, in the preparation of which every line of the previous edition has been scrutinized, and the articles re-written, partially or entire, while new articles have been prepared to embrace all new subjects required by the progress of knowledge. This edition is consequently a new encyclopædia, comprising the latest information in the whole range of human knowledge, and it is offered to the public at a reduction of ONE-THIRD from the price of any previous editions. Furthermore, we have withdrawn our former trade edition from the market.

Specimen pages sent free on application to the Publishers.

J. B. LIPPINCOTT COMPANY,
715 & 717 MARKET STREET, PHILADELPHIA.

ARE YOU A SUBSCRIBER

TO THE

St. Louis & Canadian Photographer?

NO?

WELL, YOU ARE BEHIND THE TIMES.

Send 50 Cents at once for a

3 MONTHS' TRIAL TRIP.

EVERY NUMBER HANDSOMELY ILLUSTRATED.

Amateurs like it. Professionals cannot do without it.

"I wish you success in the new Editorship, and hope that the good work of the Journal will go on, and that it will still continue to uphold and build up the legitimate photo business."
C. P. McDANNELL,
Cambridgeboro, Pa.

"Why, of course, we wish to renew. You would not expect us to try and run business without it."
E. LONG & SON,
Quincy, Ill

$3.00 per Year, $1.50 for Six Months.

Mrs. FITZGIBBON-CLARK,
2714 Olive St., ST. LOUIS, MO.

SUBSCRIPTIONS RECEIVED BY ALL DEALERS.

THE

Year Book of Photography and Amateur's Holiday Guide,

....JUST OUT....

PRICE, IN PAPER COVERS, - - - -	$0.50
CLOTH BOUND, - - - - - - - - - -	1.00

A limited number only imported : : : : : : : :

Order now, if you want a copy.

The Scovill & Adams Co. of N. Y

"Will take a first place among the Art Annuals of the year."—*Liverpool Daily Post.*

Photograms of '96

Compiled by the Editors and Staff of "The Photogram."

NOW READY.

A Pictorial and Literary Record of the Best Photographic Work of the Year. . . . .

ONE HUNDRED AND TWELVE PAGES

And Considerably over ONE HUNDRED Half-Tone Reproductions.

What the Press had to say about it

LAST YEAR.

"The finest half-tone printing we have yet seen from that country."—*St. Louis and Canadian Photographer.*

"An ambitious effort which we trust will be repeated."—*Anthony's Bulletin.*

"The pictures of London especially are very beautiful."—*Scientific American.*

"A charming book from every point of view."
—*The Sun.*

"So splendidly done that it can be classed with the best American workmanship."—*The Fourth Estate* (*New York*).

"We do not remember any book in which anything like the same number of half-tone blocks are used with such uniform excellence."—*The Artist.*

"One of the finest art collections we have eve seen."—*Belfast Evening Telegraph.*

"The supreme excellence of 'process' work a. once arrests attention. . . . Photographic reproductions- such as appear in the pages of 'Photograms,' are pert fect specimens of monochrome."—*Whitehall Review,*

"Every practical photographer and every lover of art should procure this lavishly-illustrated volume . . . a delight to the eye, and of much practical value."
—*Birmingham Daily Gazette*

"The admirable studies of figures and groups naturally raise anew the old question of 'Art *versus* Photography,' with regard to which there are some sensible observations in the introduction by Mr. Gleeson White. Certainly few would deny artistic merit to many of the photographic pictures so successfully reproduced in this volume."—*The Daily News.*

PHOTOGRAMS OF '95 may still be obtained in Handsome Cloth Library Binding, post free, 75 cents or 3/-; in Paper Boards, 50 cents or 2/-

Photograms of '96 Now Ready

In Handsome Cloth Library Binding, 75c. or 3/-

In Paper Boards, - 50c. or 2/-

Published for "THE PHOTOGRAM," Ltd.

NEW YORK.—Spon & Chamberlain, 12 Cortlandt Street.

LONDON.—Dawbarn & Ward, Ltd., Farringdon Ave., E. C.

PHILADELPHIA.—W. P. Buchanan, 1226 Arch Street.

1/2 PRICE

Dr. C. L. Mitchell's **Snap-Shot Developing Powders** sell for 50 cents per box. To convince you that they give good density and full detail without hardness, even with greatly undertimed plates, we will fill first order for half price, 25 cents (enough for half-gallon developer). Most convenient for tourists. Can be sent through the mails. Prepared as needed, therefore always fresh.

CHARLES L. MITCHELL, M.D.,
1016 Cherry St., Philadelphia.

Carried by all dealers; postage, 4 cents.

Learn how to make

Your own Engravings.

THE LATEST BOOK OUT.

Half Tone by the

ENAMEL PROCESS

Tells all about it.

Price, 50 cents, paper cover.

The Scovill & Adams Co. of N. Y.

60 and 62 East 11th St., N. Y. City.

THE FORUM 25 Cents

SEPTEMBER, 1896.

THE CHICAGO CONVENTION:

"Thou Shalt Not Steal" - - - - - - - **ISAAC L. RICE.**
Encouragement in the Present Crisis - - - **Hon. ANDREW D. WHITE.**
Fire and Sword in Cuba - - - - - - - **CLARENCE KING.**
Antitoxin Treatment of Diptheria a Pronounced Success **Dr. W. P. NORTHRUP.**
Mr. White's "Warfare of Science with Theology."
President CHARLES KENDALL ADAMS.
Of the University of Wisconsin
Progress of the Women's Rights Movement in France - **JEANNE E. SCHMAHL.**
Leader of the Movement in France.
Cardinal Manning and his Biographer - - - - - **Rev. J. T. SMITH.**
The Threatened Annihilation of the Judge-and-Jury System. **Hon. W. K. TOWNSEND.**
Judge of the U. S. District Court of Connecticut.
Early and Recent Currency Legislation: A Contrast - - - **J. J. LALOR.**

THE FORUM PUBLISHING COMPANY, NEW YORK.

25 Cents a Copy, $3.00 a Year. For Sale at all News Stands.

SPORTSMEN, ALL!

Invest one cent in a postal card and send to us requesting a **FREE** sample copy of

GAMELAND,

the monthly magazine of outdoor life. Subscription price, $1 per year. Three trial numbers, 25c.

PREMIUMS! We will give you a gun, bicycle, camera, or anything you want, if you will secure a club of subscribers for us. For instance, send ten names and $10, and you can have a $5 fishing rod. Full particulars, sample copies and order blanks **FREE**. Write to-day.

Gameland Publishing Co.,
[Incorporated,]
63 Rutgers Slip, - NEW YORK.

Stereopticon Slides

OF THE **Yosemite and Big Trees.**

FOR many years it has been almost impossible to get a set of lantern slides of the Yosemite that would give even moderate satisfaction. After very much trouble and expense, we are now ready to furnish **Yosemite** and **Big Tree Slides**, and WE GUARANTEE EACH ONE TO BE FIRST-CLASS IN EVERY PARTICULAR. We can furnish them in any quantity—one or one hundred—at **50 cts.** for each slide.

For further particulars call on or address

D. J. FOLEY,
Editor of TOURIST, Yosemite, Cal.

WILSON'S PHOTOGRAPHIC PUBLICATIONS.

WILSON'S PHOTOGRAPHIC MAGAZINE

A monthly technical journal for all interested in photography and its applications. Full of practical information, reliable formulæ, news of recent methods and processes. Brightly written and profusely illustrated. Independent and progressive in opinion. Price, Three Dollars per year; 1.50 for six months. Sample copy, 10c.

WILSON'S QUARTER CENTURY IN PHOTOGRAPHY. (Sixth Thousand.)

A complete text-book of the art, science and practice of photography and modern photographic processes. The departments given to lenses, studio construction, negative making and printing, are especially valuable. 528 pages; profusely illustrated; with index. Price, $4.00, postage paid. Contents list free.

WILSON'S CYCLOPÆDIC PHOTOGRAPHY. (Third Thousand.)

A universal photographic reference book, giving concise and reliable information upon all photographic subjects from the beginning down to date. 500 pages. Price, $4.00 postpaid. Send for special circular.

WILSON'S PHOTOGRAPHICS. (Ninth Thousand.)

This work, of which 8,000 copies have been sold, contains chapters upon every department of photographic practice, and includes a complete manual of the wet collodion process, as well as the "dry." Fully illustrated. Indispensable to photo-mechanical process-workers. 350 pages. Price, $4.00, postpaid. Detailed contents list free.

WILKINSON'S PHOTO-ENGRAVING, PHOTO-ETCHING Etc.

The standard work on photo-mechanical methods; gives full instructions and formulæ, the equipment of the photographic department, process photography, etc. 180 pages; index. Price, $3.00, prepaid. Detailed contents list free.

PHOTOGRAPHIC MOSAICS 1897.

An illustrated annual record of photographic progress. Thirty-third year. Profusely illustrated. Send for detailed contents list. Ready December 1, 1896.

EDWARD L. WILSON, 853 BROADWAY, NEW YORK.

THE ENCYCLOPOEDIC DICTIONARY OF PHOTOGRAPHY

which is continued in this issue, was commenced in the number for January, 1896 vol. xxviii, bound in cloth, and contains the encyclopœdia up to date. Will be sent on receipt of Five dollars by

The Photographic Times Publishing Association,
60 and 62 East 11th St., New York.

THE ILLUSTRATED BUFFALO EXPRESS

buys more amateur pictures than any newspaper published in America, pays good prices for them and gives the amateur credit when the pictures are published. If you have not seen the prize photographs of last year, send stamp for the Holiday Number containing them. Conditions for the next Contest will be printed in due time. Address,

THE ILLUSTRATED EXPRESS,
BUFFALO, N. Y.

$2.00 per year, 5c. per copy.

The Practical Process Worker
and Photo-Mechanical Printer.

A Representative Monthly Magazine of American Process Work.

Fully Illustrated with Specimens of the Latest Achievements in the Art.

This periodical is conducted by practical men, who give their experience in the laboratory and workshop, not by mere theorists.

Subscription price per annum, 50 cents.
Single Copies, - - - 5 "

ADVERTISING RATES ON APPLICATION.

EDITED BY WALTER E. WOODBURY.
A C. LAMOUTTE, BUSINESS MANAGER.

PUBLISHED BY The Scovill & Adams Co. of N. Y.,
60 & 62 East 11th Street, New York.

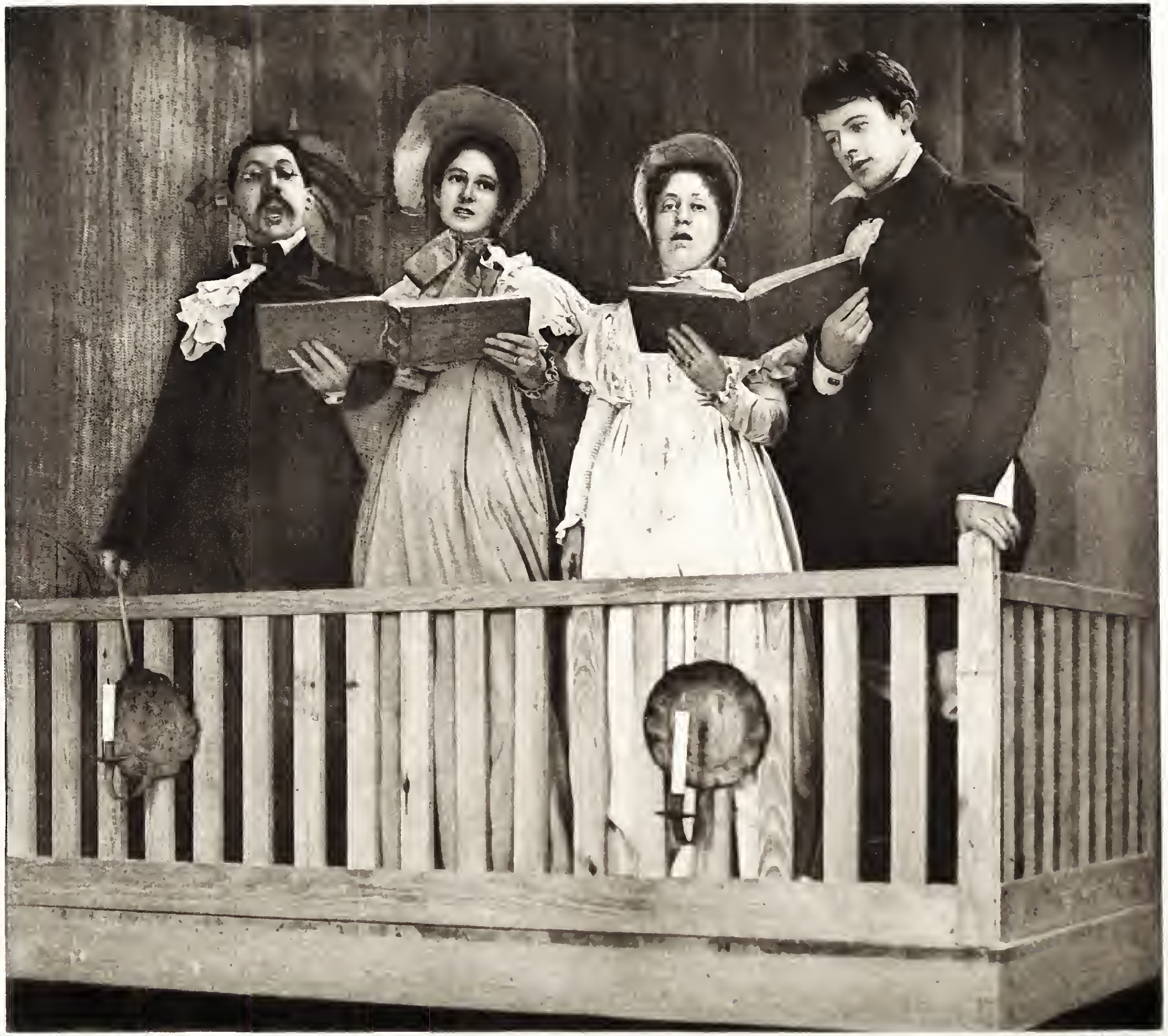
The
Photographic Blue Book

A UNIVERSAL HAND-BOOK AND DIRECTORY

Of Photographic Art, Science, and Literature; Recreation and Travel; the Amateur, the Profession, and the Trade.

Price, cloth, $1.00 prepaid; post-paid to any address.

WALTER SPRANGE, Editor, BEACH BLUFF, MASS., U. S. AMERICA.



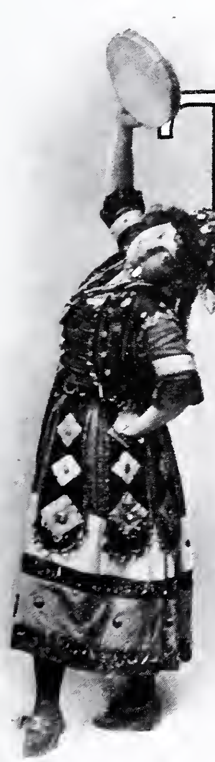
THE VILLAGE CHOIR

THE PHOTOGRAPHIC TIMES.

Vol. XXIX. JANUARY, 1897. No. 1.

THE UNPHOTOGRAPHIC PHOTOGRAPH.

BY E. LEE FERGUSON.



CARMEN
BY E. LEE FERGUSON

THERE are photographs and photographs. Some persons think that there are photographs and pictures. Some of us are imbued with the idea that a photograph itself may be a picture. We often hear a picture, regardless of the process by which made, criticised as being "too photographic." This is unquestionably perverting the meaning of a good word, as "photographic" means pertaining to photography or obtained by photography, while used in the above sense it is not properly applicable to everything obtained by photography. It is not fair to those who uphold pictorial photography to restrict this word to one class of work, any more than it is fair to insist on calling all makes of cameras "Kodaks" The time has arrived when a new political party should be launched for the purpose of securing legislation that shall preserve the purity—what there is left of it—of our language. Prohibition, immigration, the pernicious effects of bicycling, should all be laid aside, and this vital question receive the attention of all the reformers and statesmen—"out of a job."

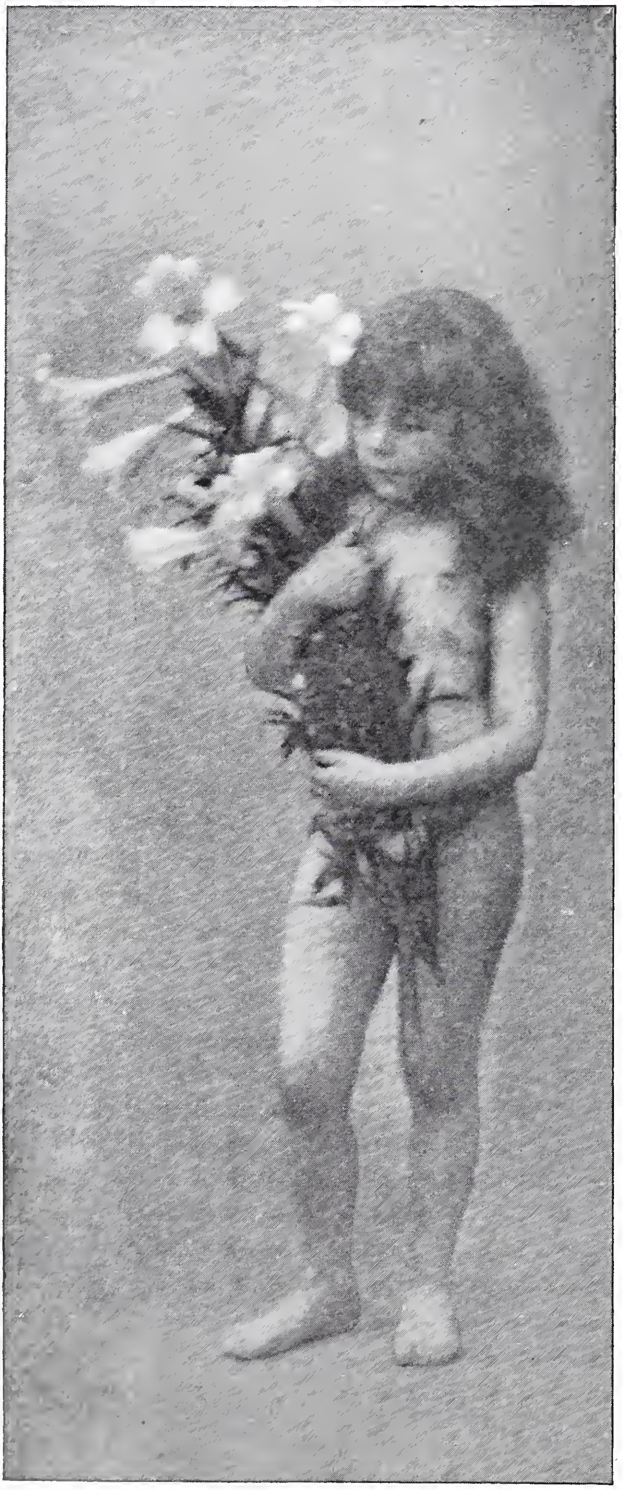
A photograph is a photograph because it is made by photographic processes without regard to the merits or demerits of the result. An oil painting is an oil painting because it is painted in oils, though the person who handles the brush is not necessarily an artist. It is so easy to make a photograph that shall reproduce everything, that the wonder and admiration excited thereby has led photographers and opticians to pursue with the greatest vigor this scientific side, and to the great mass of people this alone is photography, properly so called. There are varying grades in all work made by whatever method. When we speak of a painting we naturally have in mind examples of the best work in that line; when we mention photographs we eliminate from consideration the best qualities of artistic photography. We overlook the fact that a painting is not necessarily a work of art and that a photograph is not necessarily a crude, hard, exact representation of some object or scene. We give painting more than its just deserts and fail to recognize what good there is in photography.

In country towns a "genuine oil painting" wlll be given with a "cook stove" or with every purchase of a few dollars' worth of dry goods. These things are unquestionably oil paintings, but as works of art are on a level with the cabinet photographs at two dollars per dozen with "one of our beautiful life size copies, suitable for framing, free." A painting is a painting whether it is executed before a gaping crowd in six minutes, or a canvas on which the hand of Corot has stamped the impress of his mighty genius. A photograph is a photograph whether it be the blind, mechanical work of the peripatetic "artist," or a picture filled with the poetry and imagery that

Copyright, 1896, by The Scovill & Adams Co., of New York. Entered as Second Class Matter at the New York, N. Y., Post Office.

a Davison or a Farnsworth may infuse into their work.

At a photographic exhibition that brings out the work of those who combine art with science, we hear surprise on every hand that certain pictures are photographs. The unphotographic photograph is not new. Its supporters have always made noble efforts in its behalf, but it has been swept to one side by the deluge of photographic work that is undeniably purely photographic and mechanical. These pictures that may cause an artist a thrill of delight will arouse antagonism among many who appear to fancy that someone is attempting to get beyond the fixed scope of photography. Whether photography is an art is of little value to discuss. It is a method, and the point to consider is whether the result is artistic. To say of this result that it resembles an engraving or an etching is a poor form of commendation. Quantities of mediocre—and worse—engravings and etchings may be found with ease. Engraving, painting, etching, photography—all are methods of producing something that may or may not have artistic qualities. When a picture produced by photographic methods bears the impress of the artist's individuality, satisfies the eye, and appeals to the imagination, too many endeavor to hide the method and praise it for a fancied resemblance to another form of work, considered—properly or improperly—of a higher order. So it is that the highest form of photography becomes, to the general mind, unphotographic.



EASTER LILLIES BY E. LEE FERGUSON

There are limitations to photography, but the production of really artistic work is possible within these limits. A photograph remains a photograph however high it may rank as an artistic creation. The limitations of the method should be studied and appreciated, and then the more the broad underlying principles of art are applied to the making of the negative and the print, the more we shall see of the unphotographic photograph. May we see more and more of it until we shall recognize it as merely a higher form of the varied results of a method. Then will we not take its own name from it or feel that in so calling it we are casting reproach. Then there will be no "unphotographic photographs" and the class which I have now so designated may be recognized by all as works of art.

"WITH a short-focus lens it is impossible to obtain any true foreshortening, and every photographer gets so accustomed to this false perspective that he accepts without a thought of objection effects that would drive an artist wild. . . . The man who studies art *after* learning the *science* of photography is handicapped, he is apt to be misled by scientific and optical limitations, and to accept the result of those limitations as truths."—*G. Hammer Croughton, Photographer.*

THE TWO CHIEF PHOTOGRAPHIC EXHIBITIONS OF THE YEAR. I.—THE ROYAL. BY HECTOR MACLEAN, F.G.S., F.R.P.S

In endeavoring to give the readers of this journal some information and comments respecting the high-water mark of photography in Britain during the year 1896, as is more particularly exemplified by the exhibitions of *The Royal Photographic Society of Great Britain* and by *The Photographic Salon*, I have thought best that the article should be acknowledged, as coming from my pen rather than that my notes of admiration or of stricture should be shielded by the plural pronoun. For all criticism is so purely personal that its value, or worthlessness, depends entirely upon the individual; moreover, many a sensitive artist, palpitating maybe with those hopes and fears, elations and depressions, which, cyclonic like, sweep through the breasts of the brethren of Marie Baschkirtseff, will be more resigned at the blame of a known scribe—and perhaps less intoxicated by his praise—instead of, as sometimes happens, going into hysterics over the profound pronouncements of WE, which, did he but know it, is perchance nothing more than the awe-inspiring personification of the office boy.

Finally, being alone responible, I have a freer hand for errors of taste or of judgment. None the less it should be remembered that although merely speaking as one, I am, to a large extent, the unconscious voice of my environments, and write the following remarks with the echoes of many *obiter dicta* ringing in my ears and willy nilly, controlling my pen.

Yet just this more by way of introduction, so that I may be in complete *rapport* with my readers.

Pictorial photography has been classified in a good many different ways. For the present, my own predilections impel me to divide all such productions into two broad categories, viz., that which I term "The Robust" and that which may be called "The Emasculated." By robust I mentally picture works which make full use—or nearly so—of the native virility which is inherent in the particular photographic processes employed in the rendition of the picture under consideration. By emasculated I refer to what may be considered as photography's lost opportunities; as where clogged, or vapid, shadows—which are not evidently called for by the exigencies of composition—replace passages of enchanting gradation: or, contrarywise, where a vision of modulation and roundness of form, full of flashes of light and shadow, is translated by a weak grey expanse of dimness. Need I say that I lean towards the robust school? Therefore, I hope if those who are my friends should think I, at times, bear unduly hard upon the emasculated, they will indulgently absolve me from wilful unkindness and remember that my preference is not with the misty works.

Commencing with the Royal Photographic Society's display, one cannot, on entering the gallery, but be instantly struck at the great change which has fallen upon the walls. Practically speaking, the "show case" element is eliminated; almost as obsolete is the light mount, whilst passing away as being somewhat worn out are those theatrical and forced landscape effects taken "against the light" which, until this present year, were so much in vogue with several of our leaders.

WILLOW WREN BY R. B. LODGE

The craze—if I may so term it—of the moment seems to run in the direction of exaggerated vagueness and darkness, occasionally accompanied by much gross affectation of unpremeditation. As where, for instance, we have a portrait with the top of the sitter's head chopped off by the frame. (No. 300, Salon.)

Of course, such "qualities" as the before named have been always noticeable as exceptions. To-day they are inclined to be the rule. Hence, the first impression of the Royal Photographic Society's Exhibition is that of dolefulness, but further examination reveals much to qualify such a conclusion.

It will be, obviously, impossible—and probably not profitable—to consider and descant upon all those pictures which offer a text for critical remark. I shall, therefore, here mainly, although not entirely, confine myself to (1) the medalled works, (2) to the exhibits of those of my confreres as hail from Columbia, and (3) to those which are illustrated in the text. Of the medalled works, it may at once be said that the judges have performed a most difficult task without grave injustice. First of the medalled works, in every way, is the portrait study upon artigue paper by Philipp von Schoeller. This is quite a triumph, both for the printing process and for the photographer; none the less in a work upon which "that fierce bright light" of a hundred art specialists falls, it is not possible but that minor faults should be spoken of. How this picture is esteemed depends very much upon the day; when the light is brilliant—and even London knows what sunshine is—then is there noticed some inclination to chalkiness about the lighter passages; on the other hand, when the picture is less intensely illuminated, the face and ruff are merged into a spot of brightness encompassed by gloominess which seems to call for a subsidiary light that should destroy the not quite pleasant feeling of isolation.

LOWESTOFT EDGAR SCAMELL

In "Trau Cathedal, Dalmatia," Mr. John Bushby has not only gone off the beaten track of ecclesiastical subjects, but has produced that which, as seen at the Royal Photographic Society's Exhibition, is less an architectural study than a picture in stone, made impressive by that rare "audacity of shadow" which John Ruskin, in *Aratra Pentilici*, declares to be a not unwelcome attribute of a good photographic rendering of sculptured form. In the presence of the reproduction, verbal description is uncalled for. Only this, that the original picture possesses a combination of color, tone, and surface, which very materially heightens its æstheticism, and makes one think of some of the late David Roberts' interiors.

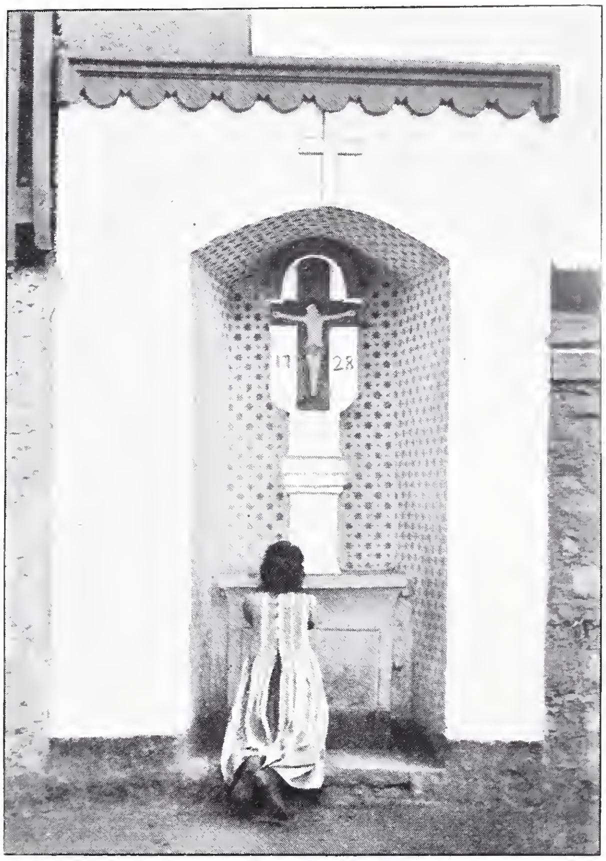
Out of a number of 12 x 10 platinum prints of English cathedrals, one, of the "North Choir Aisle at Norwich," by J. Bulbeck & Co., has been singled out and medalled. Apart from the difference of subject, this and the preceding picture are very dissimilar in execution. Messrs. Bulbeck present us with smooth, well-developed scales of gradation and with prints noticeably free from the troublesome technical defects so apt to assert themselves in this class of work. In fine, their work is the essence of correctness and, besides, may boast of considerable pictorial quality.

Next on our list is Mr. W. Thomas's "Ebb of a Winter's Day," which is one of those presentments that depend for their appreciation upon a sympathetic beholder. Such a one will on doubt find much to which his admiration will respond; this, despite some wooliness of form which suggests that not only the snow, but all the rest of the objects had begun to thaw.

Another medalled work on the same wall is "A Decorative Panel," by Alfred Stieglitz. Here we come upon a striking composition, noticeably for the severely limited plane, and radius of definition, which is focused upon the foreground; it is, moreover, eloquent of the photographer's nice appreciation of the interaction of mass and line, and is a successful example of the possible advantage of figures in

DABCHICK ON NEST BY R. B. LODGE

NEAR SUNSET
BY CHARLES JOB



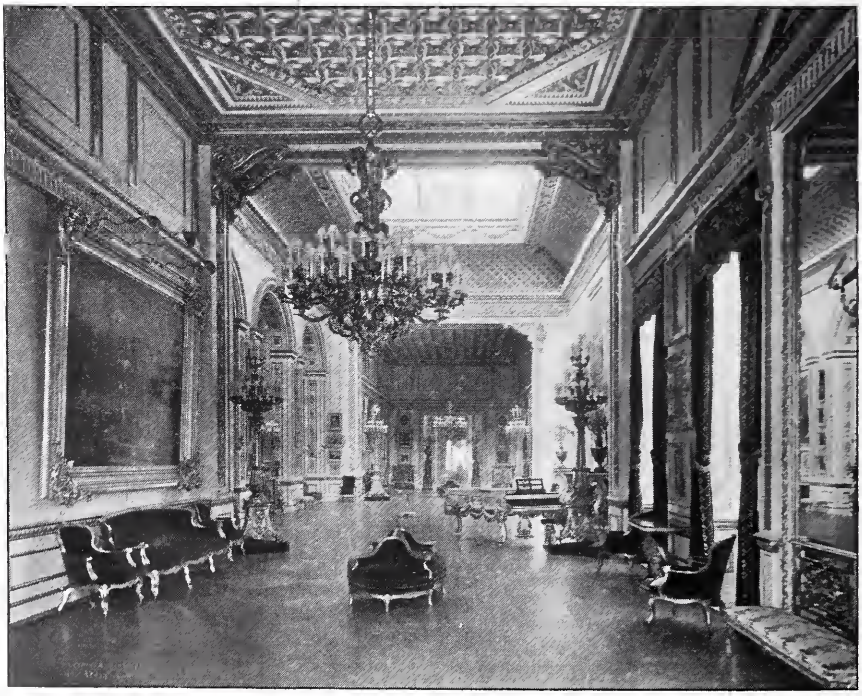
A WAYSIDE SHRINE BY E. CECIL HERTZLET, F.R.P.S.

the making of a subject which would otherwise be "hardly good enough." In that it is rather dull in the tone of its high lights and is deficient in the full power of its shadows, it somewhat leans toward the emasculated school, for all which, it has a reposeful charm which cannot be gainsaid.

Dr. George Macdonald's "Roses" are good inasmuch as many are worse. At the same time, I cannot ungrudgingly approve this bowl full of blossom. The exhibited print is heavy, suggesting rather fleshy or wooden flowers, than the "queen of all." They also give the impression of having been just hurriedly jammed into the Nankin basin, and are hence unduly crowded together; the whole subject, too, has been taken upon a plate several sizes too small. It results that the eye inclines to weariness by reason of the labarynthine multitude of petals, all folds and involucre; to make matters worse, the frame gives one no rest with its ornate boarder of aggressively twisted and curling gold moulding. For all which the composition rejoices in many strong points, as my readers may see for themselves by reference to the accompanying reproduction.

"Waiting for the Wind," by Mr. C. F. Inston, is a sea piece treated in a manner which is in many ways quite after my own mind, for it enshrines certain fundamental points which should, in my estimation, characterize a high-class photographic picture. These include a full measure of force, light, shade and gradation, employed with such artistic effect as shall ensure that each of the above heightens the influence of the others, and that all combine together in such manner that the picture shall not seem to be the result of a fortuitous combination of blind atoms. That Mr. Inston's works are due to informed aim and deliberation is evidenced by the sustained power of all four of his exhibits.

Finally, of the medalled work remaining, we have Mr. Paul Martin's "Around London by Gas Light," a series of twelve lantern slides, which are mainly wet night scenes in the streets of the metropolis, and which form a clever,



THE PICTURE GALLERY, STAFFORD HOUSE (SEAT OF THE DUKE OF SUTHERLAND)
BY H. BEDFORD LEMERE

AN APRIL MORNING BY J. CARPENTER

interesting, and original *tour de force;* and a none too wonderful set of the inevitable X-ray photographs, by Mr. Wilson Noble.

Turning to the works of American exhibitors, which I deal with strictly in catalogue order, first come two by Mr. Oliver W. Huntington. In "A Fancy Portrait," we have a low-toned, full face of a none too interesting model treated with considerable power. The figure strikes one as being rather cramped and needing for its adequate presentation a larger plate; the second work, "In an Attic," displays much skill in pictorial arrangement. But there is an abiding air of unreality about this modern young lady and ancient spinning wheel, which the title of the picture does not quite dispel.

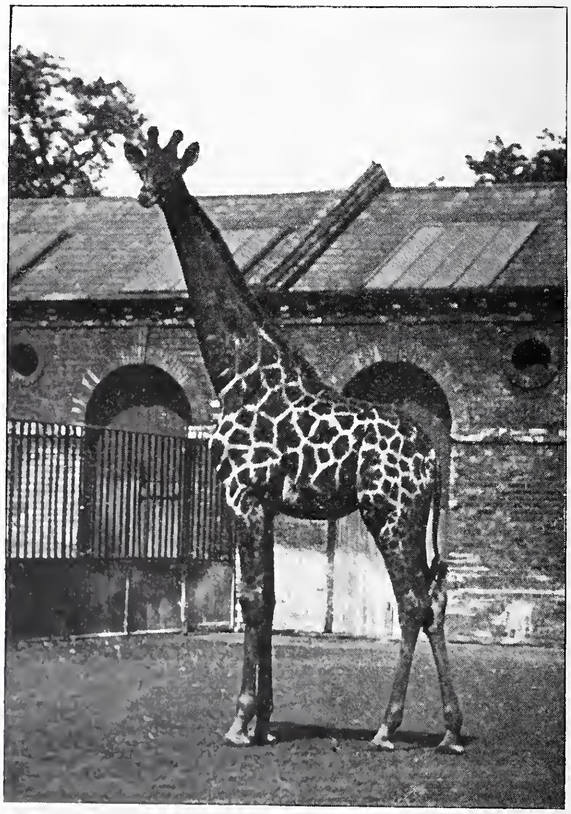
Mr. Dexter Thurber's old harridan who warms her chilled fingers at a brazier upon "A Cold Day," is commendable enough in motive and technique; the print, however, loses much by its distracting surround. The picture is of a warm brown hue whilst the broad mount is of a pale gray with an inclination to greenness that makes the setting too self-assertive. In "Christmastide," by Mr. Floyd Vail, we come upon a snow scene which inevitably challenges comparison with Mr. R. Eickemeyer's "Home, Sweet Home," (medalled in 1894). It is no disparagement to Mr. Vail's production to say that the latter must "give best" to the former. None the less does it testify to much sound appreciation of those qualities which should be present in a depiction of midwinter clothed in white. The net effect would, however, be considerably improved by slightly masking the high lights, by stronger printing, adding a darker sky, and replacing the present mount with one which is darker than the picture's half-tones.

Mr. Clarence B. Moore has set himself a hard task in personifying hatred, or "La Haine," as he prefers to call his malevolent looking head. All such subjects, whose motive is a displeasing one, can never commend the same approval as might less forbidding themes. The print, admirably as it in many respects conveys the wished-for sentiment, is somewhat marred by an inclination to spottiness, nor is its native cold-

ORANG OUTANGS HENRY SANDLAND

SEA LION HENRY SANDLAND

ZANZIBAR OSTRICH HENRY SANDLAND



DAISY, THE NEW GIRAFFE AT THE LONDON ZOO

HENRY SANDLAND

ness of tone improved by a pale cream mount. It would be better suited by a deep frame of a dull, dark green hue.

In "Easter Lilies,' Mr. Eugene L. Ferguson is here represented by a delicate child study of the semi-draped order, rendered in a style greatly reminiscent of silver point. The work is one which captured my fancy at sight; it possesses the rare quality of making the beholder wish for just a little more of that which seems so attractive.

A BRIDGE ON THE STOUR BY J. CARPENTER

Finally, of American contributions are the thirty lantern transparencies of flowers by W. A. Fraser, who is somewhat unlucky in exhibiting his collection at a time when the general excellence is higher than usual. Otherwise, it would have been all but certain that his accomplished and even set of flower pieces would have scored, for they are all very exquisitely pictured floral beauties. I can only suggest that the dead black background is unnatural and, to me, unpleasing. Moreover, the size of the flowers, when projected onto a ten feet screen, is brobdignagian, which I very much dislike.

Of other pictures, which do not fall within the foregoing classifications, mention may be made of the following: Mr. E. Cecil Hertzlet's "A Wayside Shrine," which is a touching reminder of that implicit faith yet lingering in southern climes and amongst Latin races. Somewhat allied in sentiment is Mr. Alex. Keighley's "An

MARSH MEADOW BY J. CARPENTER

Alpine Cross," which is somewhat robbed of its full effect by the "plummy" brown of its tones. Mr. John Carpenter's three landscapes displayhis talents in an unusually good light. Best of the trio is, without doubt, "Marsh and Mead," which is both unaffected and effective. Mr. Cohen's "Study of a Head" recalls some of Mrs. Cameron's work and possesses similar attraction. "All the world wondered" on first beholding Mr. Warneuke's "Portrait"; later on, it was remembered that he lives amongst the young bloods of the Glasgow school of painting revolutionists. Hence, no doubt, the foregoing pictorial manifesto couched in the language of the prophet Whistler.

"ROSES" BY D. GEO. MACDONALD

George Lamley's "After a Storm" is a delicate gem of sea and sky, over which W. L. Wyllie, A.R.A., is said to have rhapsodized. Of his others, "In a Dead City" may be placed first.

Amongst photographers who on account of their strenuous work deserve, although they have not yet obtained, the official meed of approval, is Mr. John A. Hodges, who is this year represented by as many as five pictures. Truth to say, none are as attractive as the best of his last year's prints; none the less, a riverside eventide effect, "When the Sun is Low," is an unaffected presentment embodying passages of considerable charm. Amongst the very few professional portrait exhibits may be noted a triptych by Mr. Edgar Scamell—who is best known by his hundred or more photographs of "London Street Cries"—which represents three aspects of a delightful little girlie, portrayed with much delicacy and daintiness. Mr. Charles Job contributes but one example of his accomplished style, "Near Sunset," of which the accompanying reproduction fails to convey a full measure of the glowing warmth and color of a summer sundown, suggested by the red-brown carbon of the original print. Mr. H. Bedford Lemere has mirrored the splendors of Stafford House with a perfection which he has taught us to expect.

Amongst those who show good and interesting pictorial work may be mentioned E. R. Ashton, F. A. Crew, Hugo Meynell, Henry Smith, Gay Wilkinson, Gale, Cembrand, F. Hollyer, J. Sinclair and Kidson Taylor. Outside those photographs which make strongest claim to attention, on account of their artistic aims, are a number of not less interesting exhibits which appeal to the visitor for various other reasons. Amongst these are the striking zoological studies of Henry Sandland, taken with an appreciation of the scientific points which should be present in such records, that is not often equalled. Some of the pictures have only been obtained after waiting for a year or more in order to catch the animal in a required pose. Less sensational, at first sight, are the very engrossing actualities of wild bird life, secured by Mr. R. B. Lodge, by means of a long focus lens and a long-suffering patience; in order to get some of his studies Mr. Lodge has, before now, tied himself up in a sack and lain for hours in a wet ditch. The utility of the Magnesium Flash-light is exemplified by Dr. Page May's "Contemporary Royal Portraits," of Aahmes and others belonging to the ruling Egyptian families of 3,000 years ago. Of considerable intrinsic value, and of admirable technical quality, is the "Davenant Bust of Shakespeare," by the accomplished Mrs. Catharine Weed Ward, better known to many Americans by her maiden name of Catharine Weed Barnes. Another American who takes a high place in the scientific division is Mr. Henry Troth, whose faithful and well-defined botanical examples are almost beyond improvement; the only point which I can suggest whereby a better result would be obtained is that the prints should, in each and every case, be *absolutely* life-size, and no more.

The new apparatus consists mainly of articles which depart very slightly in size, or in minor detail, from those in previous use; exception may be made in favor of the instantaneous flange, which is an inexpensive and time-saving adjunct to a camera that should find favor in the eyes of all tripod camerists, especially those who love to ring the changes upon half a dozen or so of lenses.

In concluding these remarks upon the "Royal" Exhibition, let me thank the several exhibitors who have kindly responded to my request for prints to accompany my critique. Some of the prints will, I fear, arrive too late for inclusion herewith, but will appear with the subsequent article devoted to *The Salon*.

BINOCULAR VISION. BY GEO. A. SAWYER, U.S.N.

PROBABLY the most perfect example of the photographer's art is the stereoscopic picture, when the subject is well chosen. Prints made in the form of transparencies, on glass, and viewed in a proper instrument, the resulting impression on the mind comes nearer to that of the actual scene than any other process yet discovered, and it is a source of congratulation that interest in this method of picturemaking seems to be awakened.

I have mentioned a stereoscope as one of the apparently essential elements in the combination above which goes to make up the successful result upon the mind of the observer, and gives to the flat pictures the relief and perspective of nature. Such, however, is not the case. Stereo pictures may be viewed by the unaided eyes quite as successfully as by the aid of the stereoscope, and the power of controlling the necessary muscles of the eyes to accomplish this result is easily acquired by anyone who will take the trouble to read this article.

The principal function of the lenticular stereoscope is to enable the right eye to see the right-hand picture, and the left eye to see the left picture. Incidentally the lenses may magnify a little, but that is not essential. This being the case, we may discard the instrument, and all we need to do is to look directly at the right picture with the right eye and the left picture with the left eye, and we have exactly the same relief and perspective that we get when using the stereoscope.

The ability to do this involves the power to control, by direct action of the will, muscles which we ordinarily use automatically, and, therefore, unconsciously.

When we fix our eyes on a single letter of this printed page, held at the ordinary distance for reading, lines passing through the axes of our two eyes converge and meet at a point, say, twelve inches distant. When we raise our eyes to the sky the lines passing through the axes meet in infinity and the rays are practically parallel; we have simply rotated the axes outwardly. Now, this is exactly what we want to do to see a stereo picture in relief; we must hold it at a convenient distance from our eyes and look at it as if it were at an infinite distance.

Many persons will find that they can do this at will; others will require a little practice. Stand in front of a window, moisten a bit of paper a quarter of an inch in diameter, and stick on the glass opposite the eyes. Looking past the paper at the scene outside one becomes conscious that there are two bits of paper; that is, the parallel rays from each eye take cognizance of the spot. Place a second bit on the glass at a horizontal distance equal to the interval between the eyes, say two inches; then looking at the distant scene the eyes take cognizance of four spots. By-and-by the two middle ones coalesce and seem to melt into each other, and this is the image which, when pictures are substituted for the bits of paper, forms the relief, or image in perspective.

Substituting for the bits of paper a stereo picture, and using the eyes as we did before the glass, we get as the result a picture exactly similar to that produced by the stereoscope.

Most stereo pictures are wider between centers than the normal distance between the human eyes, and to see them successfully necessitates the eyes being rotated outwardly, so that the rays are not parallel but diverge. This requires practice, but when the control is once acquired it is very pleasant to look over a collection of stereo pictures without the necessary dependence upon the stereoscope.

All this is old and elemental, and I have restated it in order to call attention to the fact that two prints from the same negative, viewed in this way, present a relief and perspective, it seems to me, quite as marked as if produced by two lenses. Take duplicate cabinet heads and look at them as suggested, and you will be surprised to find that the image detaches itself from the paper, steps out to the front and assumes a plastic form which carries a charm no flat picture is ever capable of, and one is conscious of new and undiscovered beauties in the work, and, alas! defects also.

EIKONOGEN. BY JOHN J HIGGINS, A.M., M.D.

You cannot make a solution of Eikonogen grains 12 to the ounce, hold more than twice its weight of powdered sulphite of soda without precipitation on cooling.

Avoid ammonia and its salts—also all acids; either is positively harmful.

Keep the developer in separate solutions. The one of simply Eikonogen and sulphite of soda in one bottle; the other of carbonate of potash, etc., in another, and mix in the desired proportions at the time of use.

Do not use in, or add to the Eikonogen solution either carbonate or sulphite of *potash*.

If in daily use the Eikonogen solution may be kept in quantity in a stock bottle. If not, *fill* smaller bottles with the quantity required for the compounding of your developer. Glass stoppers always.

The alkaline or carbonate of potash solution may be kept in any sized bottle. If cork stopper is used it will be acted upon by the alkali with consequent discoloration.

The addition to the developer of hyposulphite of soda within certain limits adds greatly to its energy and power, doubling, or even trebling it, with, however, a disposition to fog, and the negative obtained is not as satisfactory as usual. It is not to be recommended, but is at times useful, as in cases of necessity or as a *dernier resort*.

Potass ferro-cyanide acts as a restrainer and in some way *sui generis* is beneficial. It can be added to the Eikonogen solution, and my observation inclines me to the opinion that it helps to keep it from change.

The addition of borax to the developer *does not* hasten or strengthen its action, as stated, but the *reverse*.

It is claimed by "Burton" that Eikonogen grains 5 ad unciem and Pyro grains 2 ad unciem give equal rapidity of development.

According to "Reeb" it requires to reduce one part of Silver nitrate, of Eikonogen 0.33 and of caustic potash 0.33 or 0.235 of caustic soda, or 0.406 of carbonate of potash, or 0.841 of carbonate of soda, and that the quantity of sodium sulphite required to keep the solution colorless (whether caustic alkali or carbonate is used) is ten times the weight of the Eikonogen. In the absence of alkali five times its weight.

Eikonogen aids quinol, but nothing is gained by the addition of quinol to Eikonogen.

A second plate in the bath requires one-third longer time than the first one, and for a third plate the operation is so tedious, that it is practically useless.

"The beginning of the end"

BY J. DE BRUYN KOPS

CYCLE AND CAMERA. BY DR. HUGO ERICHSEN.

THE bicycle is come to stay, not only for business purposes and cheap transportation, but as a blessed means of recreation to countless townspeople, who are cooped up in their work-rooms during the day, and can only enjoy an outing during the evening and on Sunday. The immense popularity which the bicycle has enjoyed during the past year has caused manufacturers to vie with each other in the production of various appliances to the "steel pony" and the outfit of the cyclist. One of the latest additions to the cyclist's equipment is the bicycle camera. I am aware of the fact that a bicycle camera was on the market for many years, but it was not as practicable as the latter invention, which may be called perfect.

I have seen two bicycle cameras, both of the same pattern and both marvels of compactness. They are of the folding kind, 4 x 5 in size, and fit in a small leather case, in which there is also room for two or three plate-holders. This case can conveniently be attached to the frame of the "machine," just behind the tool-case, where it is out of the way and does not interfere with the legs. It is also provided with straps, so it can be carried on the back if preferable. These cameras retail at a reasonable price. They are not cheap, but they are well made and serviceable.

It is not my purpose, however, to call attention to the cameras only, but to dilate upon the advantages which they offer to amateur photographers who own a wheel. By means of the bicycle the amateur is enabled to reach scenery which is inaccessible to the ordinary traveller, and to take photographs of beautiful landscapes that are out of the reach of the average amateur photographer. The greatest gems may be found out of the beaten track.

Mayhap our photo-cyclist is an industrious clerk who shoves a quill all day long in a dingy city office during the week. But Sunday finds him on the road before sunrise. He reaches his destination in the coolness of the morning, spends the day in angling, photographing the pretty girls and perpetuating beautiful landscapes, and returns home in the evening when the sun is no longer terrible. On reaching his room he takes a cold sponge bath and then enjoys a sound sleep, and the morning finds him back at the office in the pink of condition, while the other clerks look jaded and worn. During the following evenings he develops the plates he took on the Sabbath, revives the beautiful sights he saw, and recalls the experiences he had, and thus lives over again the day he spent so happily. And when winter comes, he has a batch of interesting photographs to show for his summer's work.

I believe the average amateur lacks incentive. He wants some stimulant to make him work and to call forth his best efforts. And I believe that a bicycle will furnish this incentive. It will take him to scenes that he will itch to photograph, if he takes the slightest interest in the art-science.

I disbelieve in the common practice of fastening the camera on to the handle-bars, of focus-

"I HAVE A LITTLE CAT AND I'M VERY PROUD OF THAT"

BY E. LEE FERGUSON

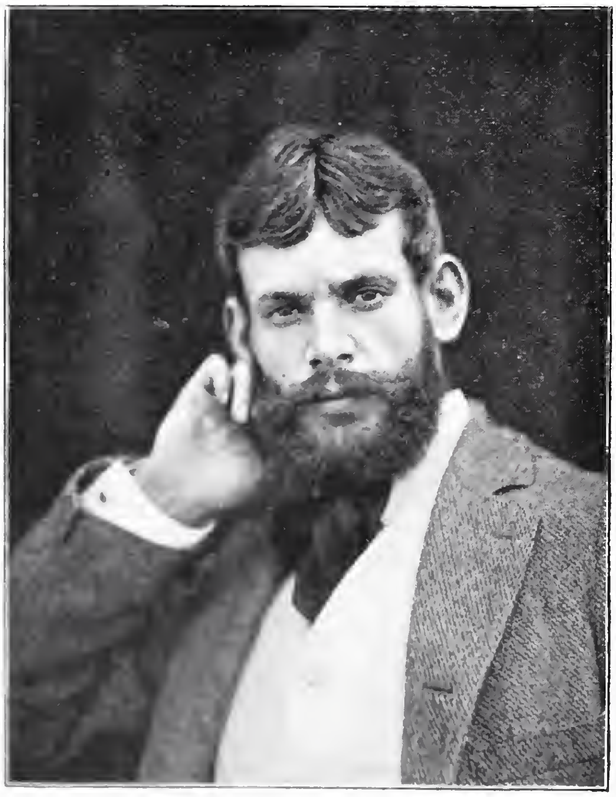
ing, and then steadying the bicycle with one hand while an exposure is made. That will do well enough for snap shots, but it will not do at all for time-exposures. It is a much better plan to carry a compact tripod strapped to the handle-bars, and to use that when necessary.

RELATION OF PHOTOGRAPHY TO DESIGNING.

BY PRUELLA JANET SHERMAN.

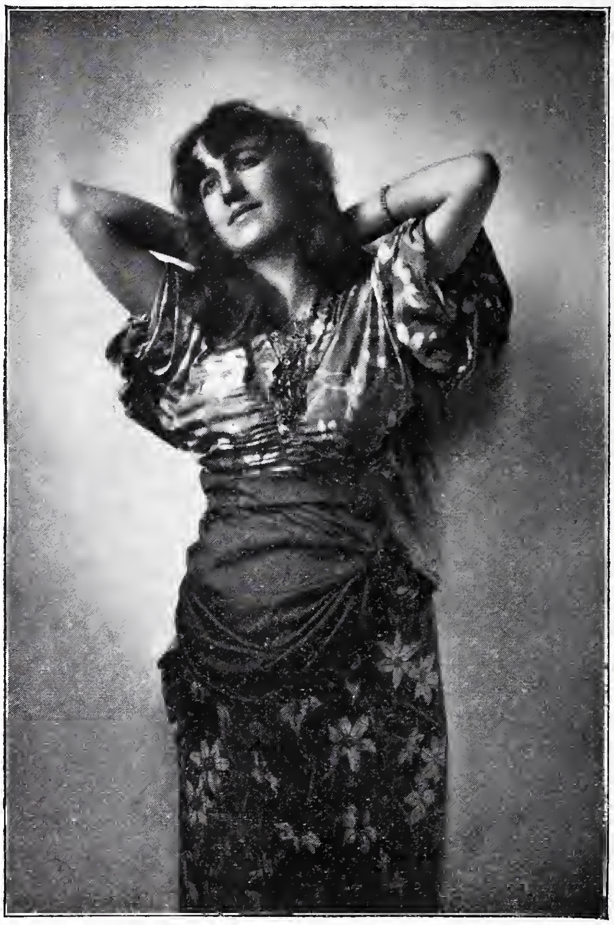
THIS is an age of illustrating. All the world is a picture, and even an advertisement without such a representation is like a rose without fragrance, and fails to attract. The artistic sense is becoming a national attribute and demands gratification, and designers are taxed to their utmost abilities.

No artist does truer work than he who paints from nature. Nothing in the realm of nature is capable of such a variety of expression and attitude as the human face and form. But the pencil is slow, and not always accurate. Meantime the designer capable of handling the camera steps in, and, with an adjustment of the lens and a quick exposure, has the picture while the sketching artist is selecting his pencil. Every point is perfect; there has been no vexation to weary the model; no opportunity for the fading of lights nor the changing of attitude.



E. DONALD ROBERTS, JR.

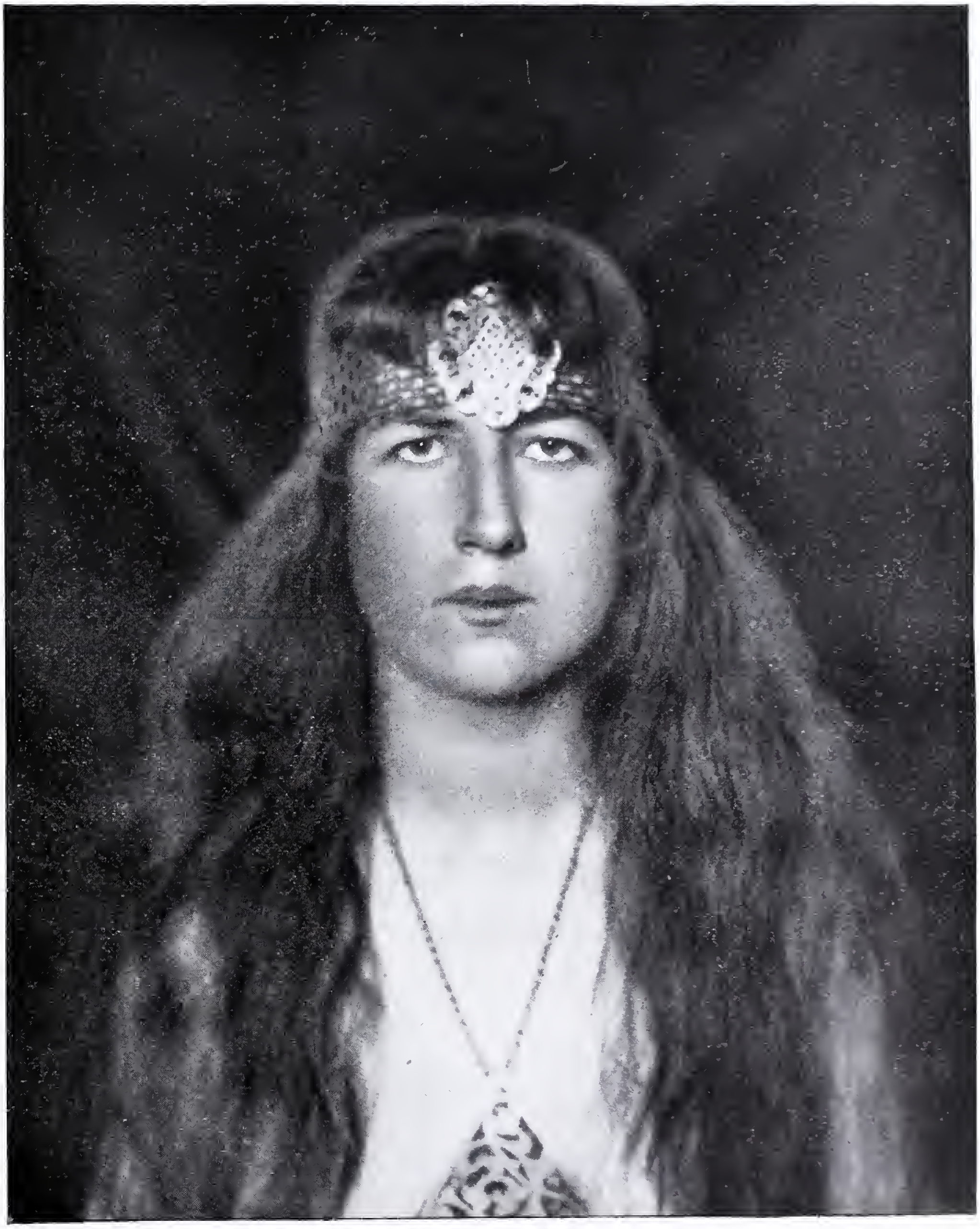
No one seems to appreciate the truth of this more than E. Donald Roberts, Jr., whose work is evidence of most gratifying possibilities. Mr. Roberts is a designer whose artistic sense is highly developed. His theory has always been to catch nature at her best, and adapt the reproduction to the best possible use.



Copyright, 1896, By E. Donald Roberts, Jr., Detroit, Mich.

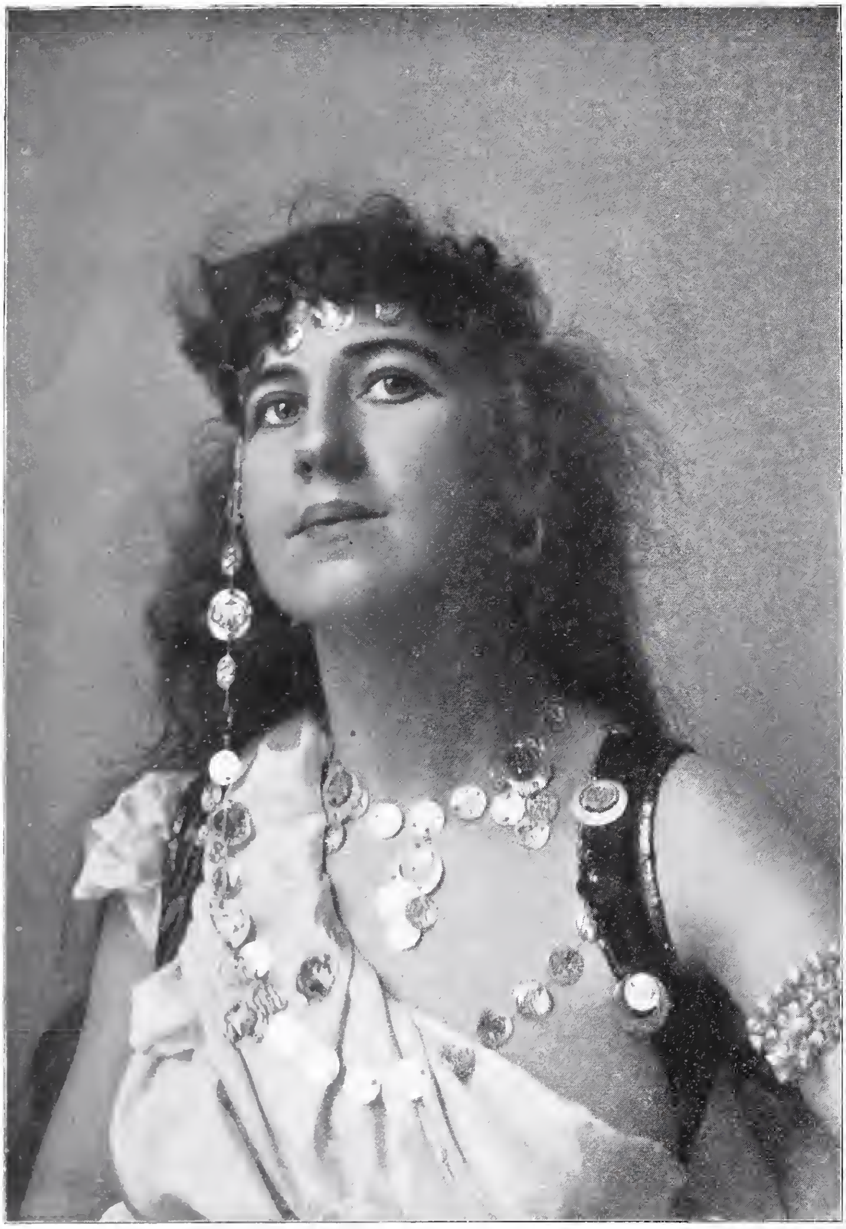
ANITA BY E. DONALD ROBERTS, JR.

To reproduce such a picture in black and white, or in colors, is to find its commercial value. Thousands of dollars are spent annually for illustrative advertising. When one enters any place of business he cannot fail to observe the lavish profusion of artistic work scattered everywhere in the shape of advertising. Nor does it stop here. The numerous posters which adorn our bill-boards, the highly-colored cards which delight the children, even the labels on



Copyrighted 1896, By E. Donald Roberts, Jr., Detroit, Mich.

NEMESIS
BY E. DONALD ROBERTS, JR.



Copyrighted 1896. By E. Donald Roberts, Jr., Detroit, Mich.

A DAUGHTER OF THE NILE BY E. DONALD ROBERTS, JR.

canned goods at the grocers, all call for more or less originality. There is no manufacturing plant, insurance company, or business house of any kind that can afford to neglect the artistic side of advertising. While, as for railroad companies, they might as well attempt to veil the beauties of the landscape along their routes as to ignore the benefits of artistic design as an advertisement.

Hence the demand for original, striking and appropriate designs. Men's brains are sorely tried and life is short, but this is also an age of progression, and mechanism must be made to lighten labor and at the same time to secure accuracy. Therefore, the successful combination of photography with designing, to observe closely, is to comprehend the intimate relation that exists between the two when the skill of the true artist directs the composition of the picture. It is the improved method of reproduction, keeping pace with the demand for originality in design.

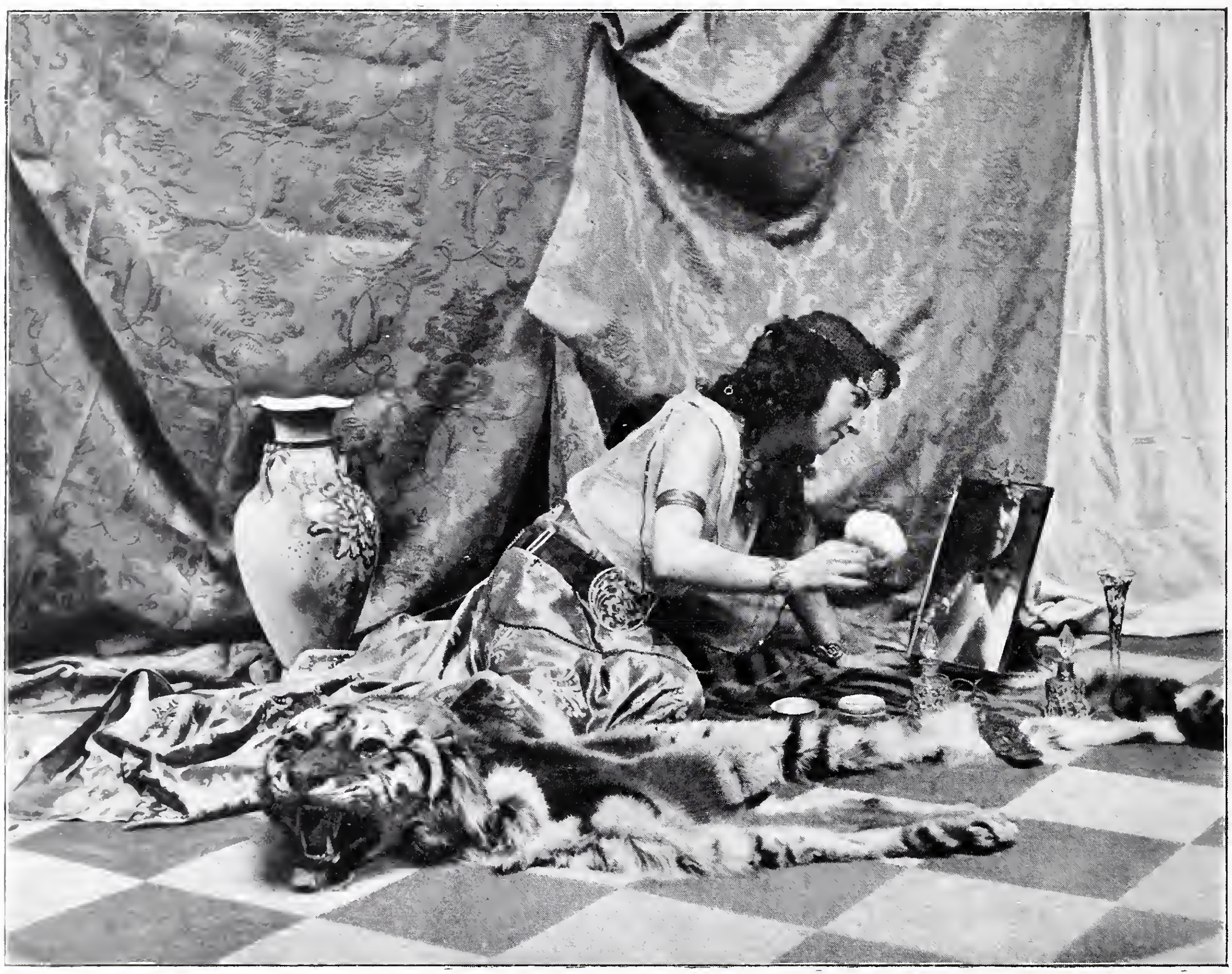
The possibilities of the camera in this direction are almost illimitable, both as to production and economy of time. An idea which a sketch artist might require several days to compose may be as satisfactorily produced in as many hours by the use of the lens. While the sketch would only furnish the idea, the camera would have caught every detail in all its completeness. But the operator must have the ability to perfect the composition of the picture with actual material, and be capable of calling forth both pose and expression. Unfortunately the number who have entered this field with success is small. There are but few who have the ability to satisfactorily combine photographic skill with originality of design.

Mr. Roberts has sketched ever since he was old enough to hold a pencil. He took up the camera about three years ago, with a determination to test its value in connection with designing, for commercial purposes, and has been exceedingly successful. He is a man capable of making the most of the material at hand, and his home overflows with evidence of the possibilities latent in a single model when controlled by artistic ability. He has also a keen appreciation of the adaptability of a design to that which it represents, and is quite capable of producing expression—if such a phrase may be allowed—at will; competent to put his model in the frame of mind and attitude of body which will tell the story his picture is meant to convey.

Copyrighted 1896. By E. Donald Roberts, Jr., Detroit, Mich

THE SERENADE

“’Neath her window a soft sweet strain
and love’s old thoughts come back again”



Copyrighted 1896. By E. Donald Roberts, Jr., Detroit, Mich.

A DAUGHTER OF VANITY BY E. DONALD ROBERTS, JR.

One of the most attractive compositions is an oriental study entitled, "Mother's Happy Hour with Baby." The mother, richly clad in the habiliments of the East, has placed baby in the tub, and, half reclining on a tiger skin, lifts the water with her taper fingers and drops it, clear and glistening, over baby's head. The apparent utter unconsciousness of the woman as to affected pose, and the real delight of the child, is perfect. There is no suggestion that these two do not suppose themselves alone; no thought put forward that they are sitting for a picture. This composition took first prize at the *Buffalo Express* competition last year. It would make a fine advertisement for a soap company.

A charming design is manifested in the picture entitled, "Whistling for More." The mother holds the baby in her lap, keeping the coveted treasure out of his reach while he tries his best to whistle so that he may be rewarded by sweets which are to him so tempting.

Another study of the same child represents "Blossoms," and is a veritable Cupid in his scant drapery of lace, and his delighted, baby smile.

Another picture of delightful naturalness is the one Mr. Roberts calls, "It's I," and was taken with the model in her every-day attire; just caught on the impulse of the moment, with no attempt at "make up."

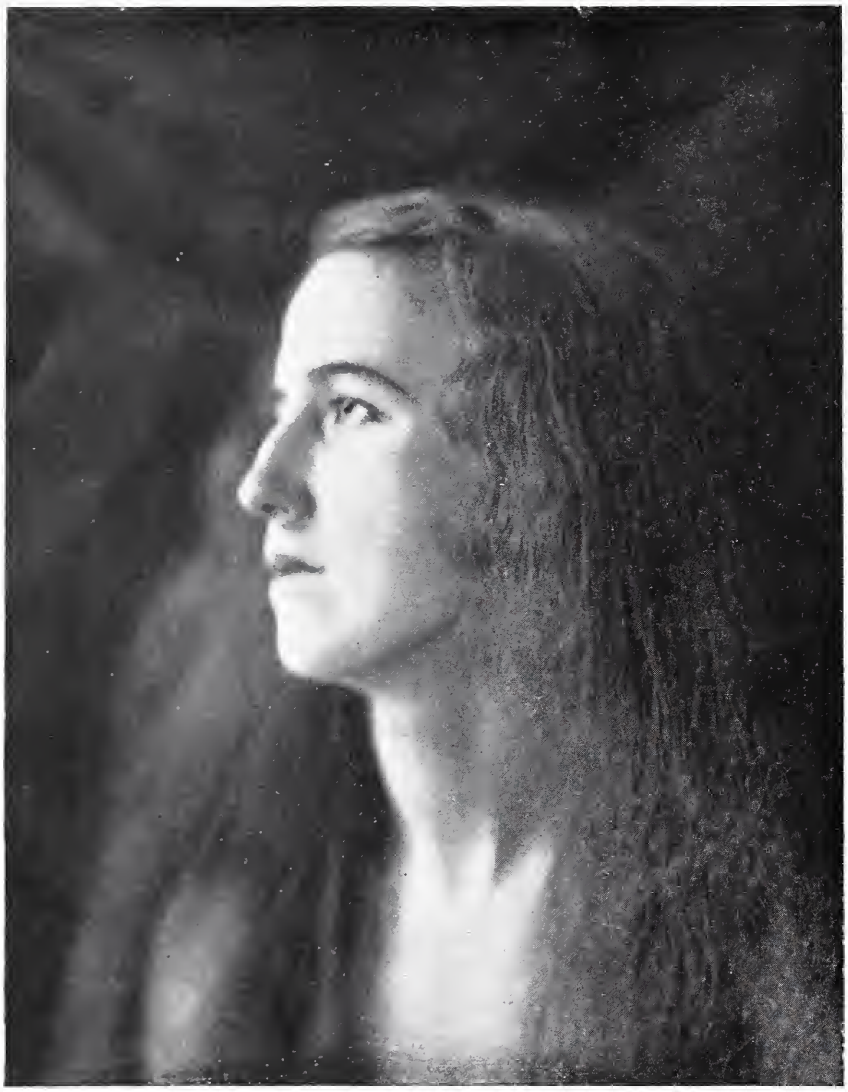
"Brighter Than My Jewels" is a young woman, exquisitely posed and draped, holding in her uplifted hand a wine glass. This would be very appropriate to represent a wine house or mineral spring company, and was ranked second at the *Buffalo Express* competition.

"The Serenade" is represented by a beautiful girl who has evidently paused while playing the mandolin, and, with absorbed, retrospective

Copyrighted 1896. By E. Donald Roberts, Jr., Detroit, Mich.

IN THE ORIENT

A MOTHER'S HAPPY HOURS WITH BABY



Copyrighted 1896. By E. Donald Roberts, Jr., Detroit, Mich.

HAGAR BY E. DONALD ROBERTS, JR.

expression in her face, listens to some sweet sound. This picture was suggested by the lines:

> " 'Neath her window a soft, sweet strain;
> And love's old thoughts come back again."

This would make a fine advertisement for a music house.

"A Modern Sultana" represents a woman of the East in oriental costume, reclining on a luxurious couch in an attitude of semi-abandon, her head resting on her hand, her eyes looking forth dreamily. It is an exquisite composition, and has been reproduced by lithography in colors. In this form it has found great favor and a large sale as a stock-hanger in various establishments.

While the range of Mr. Roberts' subject is unlimited, many of his designs are of oriental conception and betray striking originality. Many heads in his collection are adaptable to various purposes where an attractive face is required, and it is here that the wonderful power of variety of expression is most forcibly shown. The same model, by change of pose and arrangement of light, is made to represent all types, from the delicate blonde with fair, fluffy hair, as suggested in the picture of "Recollections," to the dark and rich-hued "Daughter of the Nile." Again, the same face has been transformed into "Nemesis," stern and relentless, while from the eyes of "Hagar" looks forth the shadow of despair; that in "The Flower of the East" only represent girlish innocence and beauty. Thus are expressions caught by the camera which are superb in their naturalness. "Nemesis" was exhibited at the National salon in Washington, and purchased by the government for the National Museum, purely for its artistic value.

Notwithstanding these gratifying results, Mr. Roberts has been badly handicapped in his work by want of many necessities; all of his pictures being taken by the light of a single north window. His studio is a plain little room at home, with a sheet stretched on a screen-frame for a reflector. Neither has he been supplied with expensive apparatus, his camera being but an inexpensive one, and his lens only ordinary. Very little retouching is exercised in his work, nearly all changes being accomplished before the picture is taken. No part of the work goes out of his own hands. He makes all his own costumes, using a few yards of drapery over and over again, each time with new and graceful effect.

He has, however, been exceedingly fortunate in possessing a wife deeply in sympathy with his art, who has been of great value and assistance to him in his artistic career.

E. Donald Roberts, Jr., was born in Hartford, Conn., in 1866. His talents are doubtless inherited, as his mother was not only a painter, but a musician and writer. He lived in Hartford until he reached his twenty-second year, for two years having had a studio as designer. He then accepted a position with the Forbes Lithographing Company, of Boston, Mass., where he remained as designer for three years. At this time his health failed and he found that he must be more in the open air and engage in some less confining occupation. He, therefore, accepted a position to travel for a Philadelphia house. The nature of the business of this firm being similar to his previous work Mr. Roberts found his ability to design a great assistance.

While passing through Detroit, Mich., about five years ago Mr. Roberts received an offer from the Calvert Lithographing Company, which he accepted, and has remained with them ever since. For the past two years he has made practical use of the camera in connection with designing, and is an enthusiast on the subject.

Mr. Roberts is exceedingly ambitious, constantly working for perfection, and as zealously expecting to find it; is precise in his methods, and possesses the rare faculty of being both plain-spoken and agreeable in manner. He is wrapped up in the perfecting of his art and feels that the commercial value of photography as applied to designing is soon to be comprehended by all interested in artistic advertising.

Copyrighted 1896, By E. Donald Roberts, Jr., Detroit, Mich.

BLOSSOMS BY E. DONALD ROBERTS, JR.

EXAMINATION OF CATHODE AND ROENTGEN X-RAYS THROUGH COLORED SCREENS WITH THE FLUOROSCOPE. BY JOHN CARBUTT.

1. THE cathode rays in an excited Crookes' Tube viewed through a pale yellow screen, shows increased brightness of the yellow rays.

2. Viewed through a dark violet screen, the cathode rays present a phosphorescent glow, similar to that in a low volt lamp when held in the field of an induction coil.

3. Viewed through a green screen the cathode rays present to the eye a light emerald green.

4. Viewed through a dark red screen, the cathode rays present a pale red, on the carmine tint.

The screens are of thin polished plate glass 1½ m.m. thick, coated with gelatine, colored with aniline dyes such as I use in making my photochromic screens.

Examination of Roentgen rays through plain glass and the aforementioned screens, shows that both cut off or absorb fully 50 per cent. of the Roentgen rays from reaching the screen of the fluoroscope. Screens of the following colors were placed side by side with the clear glass, viz: dark violet, green, light yellow and dark red, and when in juxtaposition, it was impossible to recognize which was clear glass and which was colored, and the eye was unable to detect any color sensation when looking through the fluoroscope with the colored screens in close contact.

These experiments confirm me in the opinion I have held from my first dealing with the Roentgen X-rays, that they are of the ultra ultra-violet, because I find they absorb the entire spectrum, while a deep violet screen absorbs all but the red.

It was early determined by Prof. Roentgen that the X-rays could neither be deflected nor refracted, and I am not aware of any experiments having been made to determine the absorbtive powers by the X-rays of the colors of the spectrum.

A NEW RESORT.

BY R. HENRY SCADIN.

Down here in the mountains of Western North Carolina is being started by a company of Northern capitalists a resort which, if nothing happens to upset their calculations, will, in a few years be noted. Beautiful mountain scenery and pretty waterfalls are to be found in every direction. Roads and bridle paths are being constructed to all points of interest, and people who enjoy walking and climbing rocks can find endless amusement at it about here, and your humble correspondent adorned with hob-nailed shoes, canvass leggings hunting jacket and a 5 x 7 camera, rambles through the forests, over the mountains, and, along the river courses, taking views for the

CULLASAGEE FALLS BY R. HENRY SCADIN

FERNLAND BY R. HENRY SCADIN

company to advertise with when the proper time comes. Mount Toxaway (or Hog-back) is the principal one of just this section. Its elevation is something over 5,000 feet. The summit is large and flat enough to locate a good-sized town on, and the views in all directions are fine. On clear days the coast line of South Carolina can be seen. On the north of this mountain lies an unbroken forest of over 3,000 acres. Deer, bear, and even panthers are at home in its fastnesses. The game is protected. At one place on the property there is a natural basin, and a scheme is on foot to dam the stream which flows through it. If this is done a lake with a shore margin of 18 or 20 miles will be formed, and which will be deep enough to run a steamer on. Arms of this lake will reach up in picturesque canons, where, in places the rocks will tower up from the water to a height of 1,000 feet. At other points the shore will be a gradual slope, lined with the forest and its carpet of dark green ferns. It will be as lovely as anything in Switzerland and what a place for the lover of scenery! be he painter, poet, or photographer. Besides the landscape attractions, there are quaint people living in these mountains whose habits of life and methods of business are as strange to denizens of other sections, as are those of a foreign people. I hope to secure some photos characteristic of their home life when I get better acquainted, and if our kind editor should again invite me to contribute to "The Annual" next year, I may have something of that kind to offer.

In conclusion I would say that we are 27 miles from a railroad and a day's journey by rail and stage from the noted city of Asheville. The air here is pure, cool, and never sultry, and is a beneficial climate for overworked portrait photographers to resort to, and calm down their shattered nerves by inhaling ozone and eating (perhaps catching) *speckled trout*.

NEGLECTED OPPORTUNITIES.

BY FREDERIC FELIX.

EACH year such an improvement of photographic equipment is shown that one can almost think perfection in apparatus has been reached. It is possible to procure an instrument for any purpose imaginable, and make it do exact duty for almost every requirement of that end, or it is possible, by some variation of parts, to have the same outfit include the advantages and possibilities of several separate ones. Nearly every objectionable feature to popular photography that could be suggested has been overcome. At one time it was the size of the instrument necessary that prevented many from interesting themselves, but now excellent outfits can be carried in the pocket; the view camera was considered too inconvenient to depend on for general use, but the many folding patterns obviate that objection; the box, or detective camera, failed to suit many because of being incapable of anything but mechanically recording mere snap shots, but the folding styles, just mentioned, do away with any such regrets, as do other styles that combine rising and falling fronts and swing backs within the box inclosures, making them lack in no detail when compared with the much depended upon view patterns. Thus it is that photography is simplified and brought nearer the people every day, and is no longer so generally looked upon as such a mystery as of old, when inconvenient and expensive apparatus kept most people from thinking of the art in any way except to associate it with the head clamp and long poses of the galleries.

People of all positions and vocations are rapidly learning the fact that they can, without the necessity of superhuman faculties or efforts, make as good use of the wonderful pictorial science as the many artists whose work they have been admiring, and there is a constant, genuine effort on the part of a great number who take up the work to emulate the examples of worthy predecessors. But the great proportion that does not look to the artistic points need not be deplored, as it is not often that the finished, beautiful work of the one and the crude efforts of the other will be confounded, and proper credit not given to the deserving one. Merit will be appreciated wherever deserved, and the more, too, if there is an abundance of opportunity for comparison. Another reason why the increasing number of interested persons need be considered only for the good, is that their prevalence so largely assists in maintaining the supply houses and aids in the improvements that are constantly going on for the general good.

People who are awakening to the possibilities of the photography of to-day cannot fail to think of times when they could have put a camera to satisfactory use, and such thoughts prompt them to prepare against a repetition of such disappointments by asking an initiation at once into the knowledge of the art.

How many times can be heard the expression, "I would have given anything for a camera just then." It is used by a fond parent who sees so many cunning things in his child too late to save anything more than a memory of them; by a physician, who remembers some peculiar case; by a traveler, who has come across something attractive in his wanderings; and, in fact, by people of almost every position and calling. Several examples of personal experience come to mind at this moment, and more could easily be thought of, where many a fine opportunity for a picture of value was lost. Of late years, since having instruments for various needs and being able to use them, there are no such disappointments, but, instead, numerous very satisfactory experiences have been had, and the prints are on hand to show for them.

When James G. Blaine was traveling over the country in a special car and train on his presidential campaign, an immense crowd gathered at the railway station to see and hear him. He left the car and delivered his address from a special stand. The people thronged around in all directions for a great distance, and the enthusiasm was such that almost every word the noted man uttered brought forth a cheer. He finished his speech and made his way back to the car. The train was ready to start. Mr. Blaine stood on the platform and began waving an adieu to the crowd. The train moved slowly and had gone a few feet when an old man from the country, who was pushing his way among the people, finally reached the track, and running after the car caught up to it and reached to Mr. Blaine a great golden apple. It was an exceptional specimen of fruit and must have been the beauty of the entire county. The great statesman took the simple gift and holding it in one hand with the other he waved adieus to the people as the train increased its speed and finally was lost to view down the track. I have always considered that an opportunity lost. Like many others, I would have given anything to have had a camera there at that moment to secure the look of pleasure on Mr. Blaine's face as he took the countryman's gift and thanked him for it. I know he appreciated that token of regard as much as if the citizens had taken him down to a banquet. The entire circumstance was a picture in itself.

A sportsman joined a party of north woods bear and deer hunters. He provided himself with the finest and truest rifle, an abundance of ammunition, a fancy blazing hatchet, the very best of everything in the way of clothing, and, in fact, left nothing, as he supposed, to be desired. But he did not take a camera along. In fact, at that time he knew little about cameras, but it was not long after his return, when thinking of what he had missed, that he acquired a photographic equipment and then longed for a repetition of the opportunities of preserving the exquisite poses of the great game he encountered in its natural haunts. He thought at the time he was losing what he could consider a great treasure by being powerless to save the scenes before him, but when he came into possession of the camera his disappointment at the loss increased tenfold. This hunter is applying himself assiduously, and intends to make a great effort, on his next trip, to bring back in his plate-holders some of the places and events that tend to raise the enthusiasm on beholding them.

One day when the late humorist, "Bill" Nye, and the "Hoosier Poet," James Whitcomb Riley, were traveling together as entertainers, they were passing along the street and came to a bulletin board covered with circus lithographs. Mr. Riley noticed a pair of giraffes in the collection, and stopping Mr. Nye in the middle of the street reached up, put one hand on Nye's shoulder and with the other pointed to the board, saying (I was close enough to hear), with a peculiar drawl, "How would you like to be one of those creatures?" Then both laughed as though it was the greatest piece of humor. I would like a photograph of that pair as they stood for the moment, and many times has the regret come that a camera was not at hand at the time. Of course, in a case of that kind it would have necessitated the use of something after the supposed detective style, but then one could be sure that, under any circumstances, such a couple of jovial characters could have no objection to such a proceeding, even had they known of it.

These examples are very inconsequent in comparison with many others that can be heard of from almost any source, but such things as much as anything else, prompt people to arm themselves against the possibilities of future disappointments of a similar nature.

"NATURE can only suggest what stimulates the poet to the conception of a whole; and the poet must have the capacity to be so stimulated."—*Joseph Skipsey, the Miner-Poet.*

TYAG; OR, THE RENUNCIATION.

BY SHAPOOR N. BHEDWAR.

INTRODUCTION.

> "The highest thing that art can do, is to set before you the true image of the presence of a noble human being."—RUSKIN.

ART is nature humanized and the following pictures are calculated to spiritualize art by inspiring into our life nobler aims and purer aspirations. The inner workings of the mind of the Yogi-Raj and his would-be disciple are so portrayed as to leave no doubt as to the meaning of the story intended to be conveyed by these productions and help us to the elucidation of the mysterious problem of our future existence. Powerful as art may be in the accurate representation of visible nature, the highest triumph is secured when the deepest emotions of the heart and the innermost workings of the mind are vividly delineated. These pictures convey to us, what a new aspirant to advancement and progress in his spiritual career is required to know and study. The would-be disciple is, first of all, taught the entire eradication of selfishness in all forms and the cultivation of broad and generous sympathy in an effort for the good of others; secondly, the absolute cultivation of the inner spiritual self by meditation; thirdly, the control of all carnal desires; and lastly, the careful performance of every duty belonging to one's action in life without desire for reward. By a faithful adherence to these laid-down rules the probationary "chêla" does not fail to attract the attention of those who watch the entrance to the path, for that nobler order of the Yellow Robe standeth to this day, to help the world From the moment of acceptance, the "chêla" stands entirely on his own merits, the teacher not compelling him in any way nor giving him other assistance than to point out the path along which he must go. Every step of the long, uphill path has to be travelled by the self-conscious effort of the aspirant himself. The progress of a neophyte depends on his unselfish devotion to the truth under whatever aspect, on his desire for spiritual progress, on his love for humanity, and on the intensity of his motives. Unselfishness, self-sacrifice to the higher interests of others, gentleness, purity of body and mind, patience and fortitude, have all to be attained at an

I.—WEARY SITS THE YOGI-RAJ

II.—ABIGAIL. THE SURPRISE

III.—ALL INTENT THE PALM HE READS

early stage in his progress, if success is to crown his efforts.

> "When one
> Abandoning desires which shake the mind
> Finds in his soul full comfort for his soul
> He hath attained the Yog!"

Thus the first seven pictures of this series are made typical of the seven births that a "chêla" in his progress of the attainment of his degrees takes, thus completing the first cycle on the path of spiritual progress; while the eighth is made symbolical of the end of the first stage of the progress of the disciple.

1st.—Weary sits the Yogi-Raj.

Here the Yogi is made to represent the highest embodiment of humanity in its fully evolved and perfected state of Yogism, which is akin to saintship, and who is supposed, "with fast and frequent watch and search intense of silent meditation," to have attained the highest object of treading the path divine. He is supposed to be a great initiate into the mysteries of life and soul and death, and who by deep devotion has come to acquire supreme purity and perfect control over self.

> "Soul is self's friend when self doth rule over self.
> But self turns enemy if soul's ownself hates self as not itself."

No impurity of thought ever touches him, no impurity of action ever stains him, for he must be pure in the threefold cord of duty, that threefold thread of thought, word, and action. Supernal truth, compassion, and fortitude are the virtues he has acquired by practice and steady meditation. By a deep study he has attained such a sense of prevision that merely by the force of his inner consciousness he comes to forsee the coming to the path of his would-be disciple and intuitively goes and sits near the the house of an Amir.

> "For holy spirits feel all force divine
> And know the sacred presence of the pure."

His daughter—"Amira, loveliest of all the dark-eyed daughters of the plain"—believed to be religiously inclined, is portrayed in the subsequent pictures as the heroine of the set.

2d.—Abigail—The Surprise.

The Amira is apprised of the visit of such a well-known Yogi-Raj through her abigail, who has by accident come across the path of the "Wandering Lord." The graceful maiden with her pitcher akimbo, bent on her morning mission of bringing water home, sees the venerable sage in a state of semi-trance wholly wrapt

> "In keen unravelling of the Threads of thought
> "And steadfast pacing of life's labyrinths,"

and is awakened by her soft foot-falls. He wakes up from his spiritual musings and the maiden is emboldened to approach him nearer.

IV.—THE MYSTIC SIGN

3D.—ALL INTENT THE PALM HE READS.

The religious looking man looks up and the sylph-like maiden thinks of consulting him as to her future course of life by offering him to read the palm of her hand. The hoary sage being an expert at divination reads in the palm all intent, "the perils past, the crosses to ensue;" which impress her so much that she hies home to her mistress and informs her of the illustrious visitor being in her vicinity.

4TH.—THE MYSTIC SIGN.

The Amira, who is naturally inclined towards religious study and prone to mystic inspiration, yearns to meet this exalted personage and commands her maids to send for him. He is escorted into the house with all the distinction and dignity befitting his rank. Then craving leave the devotee expounded the philosophy of the Hindu Trinity. "Trirupa"—or Trinity as it is in every great religion, is the representation of the manifested God and that the Three are but a threefold manifestation of the One—The Universal A U M (God). He then explained at length how these three aspects of the One Unmanifested Existence can be known by their manifestation and visible expression in the universe. In this threefold Logos is seen the aspect of power, the aspect of wisdom, and the aspect of love. He then pointed out to his fair listeners the circlet formed by the little finger and the thumb of his right hand, which is symbolical of the limitless ocean of eternity, having no beginning and no end, which is to all an unfathomable mystery and represents the Great Unknowable.

V.—THE SOUL'S AWAKENING

VI.—THE WORLD RENOUNCED

"Before beginning, and without an end,
As space eternal and as surety sure,
Is fixed a power divine which moves to good,
Only its laws endure.
The heart of it is love, the end of it
Is peace and consummation sweet. Obey!"

Here he repeated from the "Shastras"—"In order to become the knower of all self thou hast first of self to be the knower. To reach the knowledge of that self, thou hast to give up self to non-self, being to non-being. Seek refuge in thy soul, have there thy heaven." Such a masterly exposition of the Vedic philosophy, by the Master of the Yellow Robe, inspires the Amira so much that in a furore of religious yearning she resolves to embrace his doctrines and by following the footsteps of her master become his true disciple.

5TH.—THE SOUL'S AWAKENING.

In the excitation of her religious enthusiasm the Amira repairs to the temple of Shiva with her youthful companions. There she sees the

VII.—THE PARTING

"Guru" lost in self, his self into hisself, merged in that self from which he first did radiate—the spark lost in the fire, the drop within the ocean, the ever-present ray becomes the all and the eternal radiance.—Her soul was awakened.

6TH—THE WORLD RENOUNCED.

The Amira, whose soul is now fully alive to the arduous task set before herself of treading the Path Divine, resolves to persevere seriously in the pursuit of self-knowledge, and to struggle firmly with the personal, the transitory, the evanescent, and the perishable. Donning the yellow robe, on bended knees to the Voice of the "Guru," she listens.

> "Measure not with words
> The Immeasurable, nor sink the string of thought
> Into the Fathomless. Who asks doth err,
> Who answers, errs. Say naught !"

"O beginner! shun ignorance and likewise shun illusion. Avert thy face from world deceptions. Mistrust thy senses, they are false. Let thy soul lend its ear to every cry of pain like as the lotus bares its heart to drink the morning sun. Let not the fierce sun dry one tear of pain before thyself hast wiped it from the sufferer's eye. Those tears, O thou of heart most merciful, these are the streams that irrigate the fields of charity immortal. Be humble, if thou would'st attain to Wisdom. Be humbler still, when Wisdom thou hast mastered. Restrain by thy Divine thy lower self. Kill out desire, but if thou killest it take heed lest from the dead it should again rise. Aye, great is he, who is the slayer of desire. Still greater he, in whom the Self Divine has slain the very knowledge of desire."

> "Seeking nothing, he gains all;
> Foregoing self, the Universe grows 'I'"

"Have patience, candidate, as one who fears no failure, courts no success. Fix thy Soul's gaze upon the Star whose ray thou art, the flaming star that shines within, the lightless depths of ever Being, the boundless fields of the Unknown. Take then as much as merit hath in store for thee, O thou of patient heart. Be of good cheer and rest content with fate."

> "Veil after veil will lift—but there must be
> Veil upon veil behind."

7TH—THE PARTING.

Now arrives the time of parting from her lifelong co-mates and companions and a hard time of trial it is for all concerned. The comeliest of the abigails impresses on the cheek of her mistress a sisterly kiss, and with a hug and an embrace as cordial as it is sincere, the new

VIII.—ON THE TEMPLE STEPS

aspirant to the spiritual Path is allowed to pass on out of the Temple, and the other handmaids are left to shed bitter tears of grief for their loss.

8th.—On the Temple Steps.

Having complied with all the rules of spiritual progress in the foregoing seven pictures, the Disciple comes out of the Temple, and headed by the Yogi ascends the first portal on the stage of the second cycle of Spiritual Birth. It is thus by purging past wrongs and adding not thereto, complete in love and lovely charities that the Disciple attains Blissful Nirvana—sinless, stirless rest—that change which never changes.

EFFECTIVE APERTURE OF LENSES FOR NEAR OBJECTS. BY WM. A. KAREN.

A contributor to *The Amateur Photographer* in an article entitled "Exposure," reprinted in the November number of the *Photographic Times*, makes the following observation in regard to the increased time of exposure necessary for objects situated near the camera as compared with objects more distant: "Nearer subjects require so much more exposure than longer distance ones, because the shadows are heavy, and there is so much more detail to be registered."

The reason here assigned is not the correct one, and as all the phenomena of photography are explainable by deductions from optical formulæ there should be no exception in this case. There is a much better reason for the increase in the time of exposure than the one quoted, and since it is an important factor in photographic optics it is worth our while to give the subject a few moments' consideration. When a lens is designated as having, with a certain diaphragm, an effective aperture of say *f*/8, it is meant that it has that aperture when it is focused for incident *parallel* rays, that is, when the ground glass with its sharply focused picture is situated in the principal focal plane for that lens. If, though, the ground glass be moved back so that objects near the camera may now be focused sharply, then the lens is no longer working at *f*/8, but at some aperture less than *f*/8, say *f*/10, and hence the quantity of light that reaches the plate is of less intensity than before, and a longer exposure is, as a matter of course, necessary to produce equivalent results. But why does the lens no longer work at *f*/8 when the ground glass is moved away from the lens? A lens works with greatest aperture, and hence with greatest delineating power, or the power of registering the greatest sum of detail, when it is adjusted for the principal focal plane, because there every point on the ground glass is illuminated by a pencil of rays of greater angle than is possible in any other plane more distant from the lens; because the diaphragm subtends a smaller angle from any point in the ground glass when it is racked back than when it stands in the principal focal plane where it is nearest the lens—pretty much in the same way that one can see more of the sky and be more illuminated by it when standing *near* a window than by retiring to the opposite wall.

In estimating the time of exposure that we are about to give to an object close to the camera we should remember that under such conditions we are not using the nominal aperture of the lens that is expressed in the diaphragm we insert in it, but only a part of it, simply because the diaphragm opening then subtends a smaller angle, and because the nominal aperture of a lens is based on the presumption that we are dealing with incident parallel rays.

Let us see how the thing looks in a diagram:

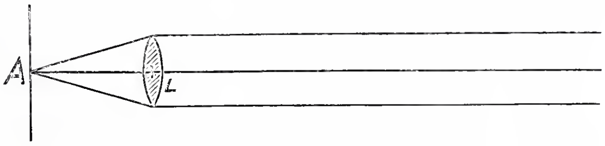


Fig. 1.

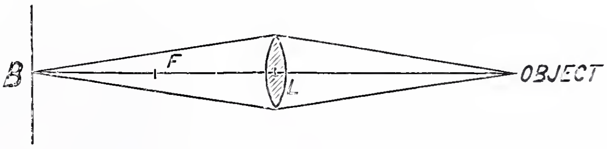


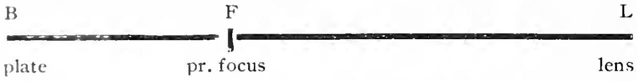
Fig. 2.

In Fig. 1 the ground glass is placed in the principal focal plane, and hence the incident rays that focus sharply are parallel rays; in Fig. 2 the ground glass is set back to twice the focal distance; it is then, of course, in adjustment for an object placed an equal distance in front of the lens, but it is also apparent that the angle at B, Fig. 2, is only one-half that at A, Fig. 1, and since illumination varies inversely as the square of the distance it follows that only one-fourth the quantity of light falls on every print in the plane at B as compared with A, and that in consequence the time of exposure must necessarily be multiplied by 4 to obtain the same light effects as at A.

For adjustments between these extremes it is clear that the time of exposure for near objects must be multiplied by the square of the quotient of the distance between the ground glass and diaphragm, divided by the principal focal distance, or by

$$\left(\frac{B\,L}{F\,L}\right)^2.$$

If the camera bed has the principal focus marked on it one can readily estimate this quantity; say the situation is as follows:



If F L is the principal focal distance, and B L be the adjustment for some near object, then it is easily observable that $\frac{B\,L}{F\,L}$, in this case, will be about 1½, and that the square of 1½ is equal to 2¼. Now then, multiply the time that you would have given to remote objects by 2¼ and you will have made a proper adjustment for the condition that the object is near. No account is taken here of other disturbing factors, as for instance, the element of haze due to distance which tends to annihilate all shadows.

TUNING FORKS PHOTOGRAPHICALLY APPLIED TO THE MEASUREMENT OF MINUTE INTERVALS OF TIME. BY ALBERT C. CREHORE AND GEORGE O. SQUIER.

An improved application of photography to the accurate measurement of minute intervals of time has recently been developed in carrying out some experiments upon the motion of projectiles inside the bore of a gun, at the United States Artillery School, Fort Monroe, Virginia. In these experiments, since the apparatus used permitted as many as seven observations being taken upon the projectile within the first 57 cms. of its travel in the bore, the problem involved the accurate and reliable measurement of time units which bear about the same relation to a second as a second does to a third of an hour. The ordinary method of obtaining a record of a vibrating tuning-fork photographically is to cause one prong of the fork to cast its shadow by means of a light beam condensed upon it, upon a narrow slit in a camera provided with a moving photographic plate close behind the slit.

The record obtained by this method is a strong shadow of the prong with a wavy edge due to the vibration of the prong. With a high fork and a comparatively slow motion of the photographic plate such as when the plate is allowed to fall past the camera-slit under the influence of gravity alone, the wavy edge from which the time measurements are taken has fairly pronounced maxima and minima permitting sufficiently accurate settings for ordinary purposes being made upon it by means of the reading microscope. But when the motion of the photographic plate past the exposed slit is great, this wavy edge becomes drawn out so that the error of setting is increased manyfold and prohibits the method.

The diagram Fig. 3 shows the principle of an improved method of obtaining fork records which give beautiful results and greatly increase the possible accuracy of such records.

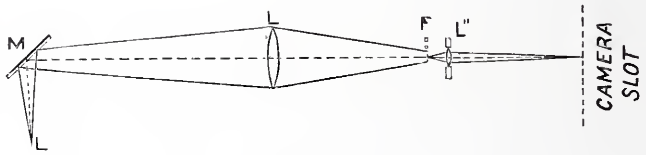


Fig. 3.

One of J. B. Colt's projection arc lamps, *L*, was used as a source of light. A plane mirror, *M*, reflected the light through a condensing lens, *L'*, upon a thin piece of aluminium foil glued to one prong of the fork, *F*. In this fork was a smooth round hole about one millimeter in diameter. A lens, *L''*, focused this brightly illuminated hole as an object upon the sensitive plate, and at the same time magnified it to about six millimeters. The fork was excited by drawing a wedge from between the prongs in preference to using any electrical method, as this was found to be convenient and satisfactory.

When one prong of a fork is allowed to cast its shadow through a narrow slit upon a moving plate the result is that a single sinusoidal line divides the region of light from the shadow of the fork. At the same time the other edge of the fork gives another similar sinusoidal curve which is ordinarily separated from the first curve so as not to interfere. By having two slits near together one above another, a second shadow would fall on the plate having an exactly similar wave for its boundary, but it would lag behind the first wave by an amount depending upon the speed of the plate and the distance between the slits. This would therefore intersect the first wave at regular intervals of a wave length, and by the points of intersection make it possible to measure with great nicety the value of a wave length. Instead of having two slits the same object was attained by allowing the illuminated image of the magnified hole in the piece of aluminium attached to the fork to fall upon the plate. Those parts of the image which fell somewhat behind the rest gave waves differing in phase with the other part, so that results like those exhibited in Figs. 1 and 2 were obtained. It is noticed that a cone of darkness intersects a cone of light, the dark region having had no exposure, and the light cone, so to speak, a double exposure. The fine circular lines seen are shadows cast by ordinary hairs fastened across the slit. They serve merely as reference circles by which the centre of revolution may be accurately found. To allow the whole area of the magnified image of the illuminated hole to fall upon the plate, a square hole of suitable size was filed away from the jaws of the camera-slit opposite the point where the tuning-fork record was to fall.

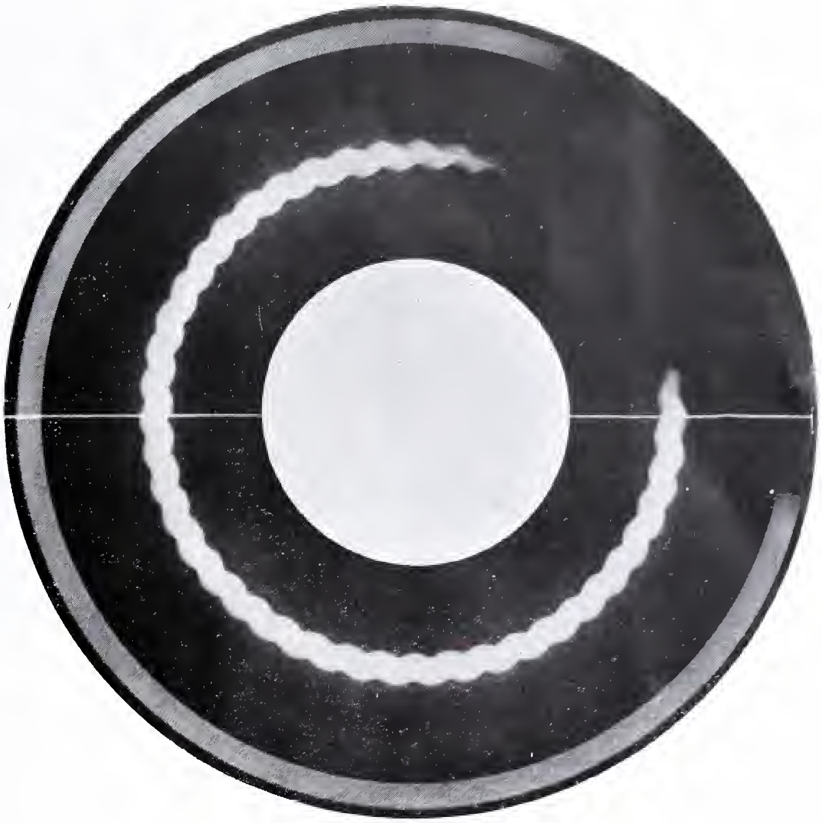


FIG. 2—TUNING FORK. 1,024 (SINGLE) VIBRATIONS PER SECOND

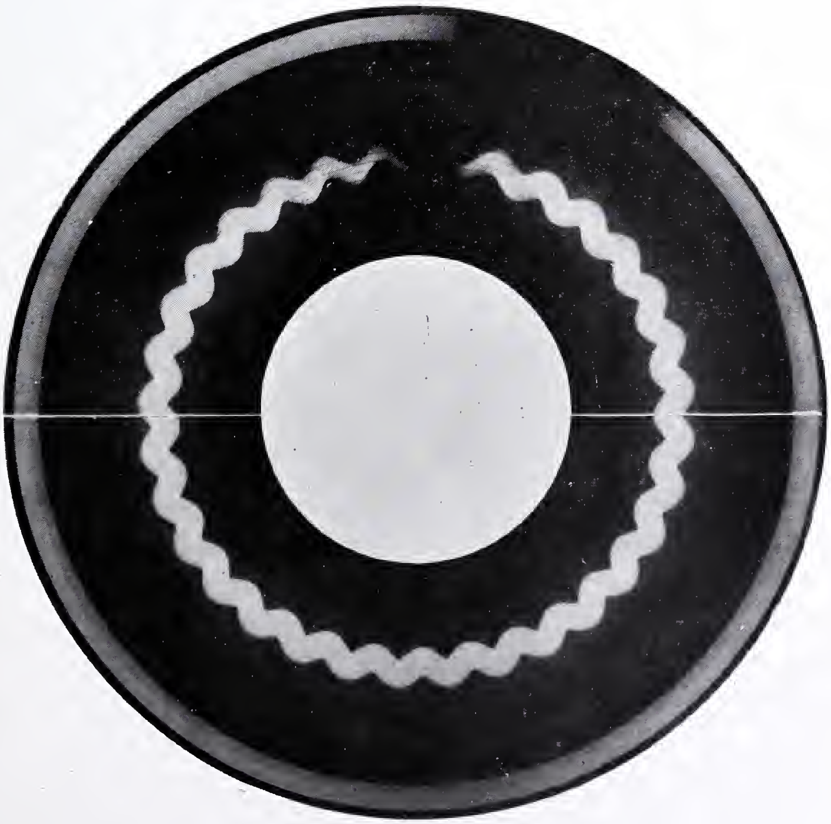


FIG. 1.—TUNING-FORK. 512 (SINGLE) VIBRATIONS PER SECOND

Since all measurements were taken from the negatives themselves, which were suitably mounted upon an angle measuring in-

LANDSCAPE BY H. TROTH

strument, the beauty and accuracy of the records should be judged from the negatives and not from the prints, since the latter fail to reproduce the delicate shadings and sharp intersections which permit the much increased accuracy of setting under the microscope.

These records are interesting from a purely physical point of view as a means of scientific research, and when it is understood how easily they may be obtained, it seems certain they must find a place in laboratory investigations where former methods left so much uncertainty as to the exact location of the maximum points of the waves.

ORTHOCHROMATIC PHOTOGRAPHY. BY MILTON B. PUNNETT.

ADMITTING that there are virtues in orthochromatic plates, then why have they not come into more general use?

The answer, I think, lies in the fact that these virtues do not become apparent unless a yellow screen is used, or the plates are very slow. One can readily see from the above that a maker of orthochromatic plates finds himself in the following dilemma: If he makes his plates slow so that they will retain their orthochromatic properties at a maximum, they will be too slow for general portrait work, and if he increases their speed, then they will partially lose their orthochromatic properties, and a yellow screen will be necessary, which will greatly increase the exposure and thus offset what he has gained.

But there is another method which seems to be quite overlooked lately. I refer to the "Bath Method." My means of a proper bath, such as published by Vogel, Obernetter, Ehrmann and others, orthochromatic properties can be given to any clear, rapid, fine grained plate. The orthochromatic effect is more pronounced with such a plate than with one dyed in the emulsion. Their greatest drawback is that they will not keep, only about eight days, but to the process worker who knows a day ahead what work he has to do, this should be no detriment. In the evening he could bathe the number of plates he wishes to use next day and dry them over night in a dust free, well ventilated room. Choose a plate free from fog and with not a comparatively yellow film.

That some makes of double-coated plates give very good orthochromatic effect with an increase in exposure is a fact that should receive more attention. Their keeping quality being equal, if not superior, to that of the ordinary single-coated plate is also greatly in their favor. Why they give orthochromatic effects is explained by the theory that those parts of the image formed in the upper coat by the so-called actinic rays, become partially reversed by the comparatively long exposure and thus begin to lose in density, while the non actinic rays have in the same time had a chance to build up their share of the image and thus overcoming the unequal effects of the light. The under coat prevents

halation in the upper. It might be asked, why would not the effect produced by the actinic rays on the under coat counterbalance the effect produced by the reversal of the upper? The theory that a certain amount of light must certainly act on the silver salts in the film, before they are brought to in a state susceptible to the developing agent, and that the total amount of light which reached the under film in the given time is not sufficient to bring about this condition, I think explains the matter. If the exposure is very much prolonged, the under film is affected.

While on this subject I would like to refer to an article which appeared in the October number of many of the photographic journals. The results obtained by the author of the article in question are in a number of cases, contrary to the experience of others, and while the experiments may have been made and the article written with the best of intentions and honesty, the fact that three different brands of one maker's plates were used, and but one each of the others, also the "Use Dr. Pedler's Pills—Brown, Jones & Smith's are no good" spirit in which it is written detracts from its merits and creates a feeling of distrust of the results.

As the cuts to illustrate the article were furnished to the various journals one can conclude that the author either had the welfare of photographers very much at heart, or that there was "a greater power behind the throne." In conclusion I would advise the worker in his leisure time to try the different methods and plates with thoughtful care, and when he finds something better than he has been using, to adopt it in spite of somebody's theory or chart. If he has no leisure now-a-days, he's a lucky man.

"Prove all things; hold fast to that which is good."

SHARP FOCUS, AND OTHER MATTERS. BY A. HORSLEY HINTON.

In the small provincial town in which I live the comparative isolation from the larger centres of civilization constructs a narrow and circumscribing horizon within which the greater events outside interest but little and a somewhat narrow and less enlightened view of things in general exists, and I have observed how it is possible for a man to have his whole private character condemned in consequence of some single public act.

I presume, were I to walk abroad *one* day in masquerading costume, I should be put down as *always* mad, given to eccentric habits, no matter how exemplary my conduct for years previously or subsequently. Were I to meet a renowned ruffian and, in compliance to a civil request, gave him a light for his pipe and exchanged a single sentence of conversation whilst so doing, and were seen thus, I should at once be put down as a sympathetic friend of that ruffian and myself regarded as a rogue.

So in one's work. Were I to deliver twelve lectures for the benefit of some institution of recognized respectability, but gave number thirteen for, say, some socialistic order, I should be regarded as a staunch supporter of the latter and my twelve times greater support of the former would be forgotten and count for nothing. It is so with men in prominent positions in life: their many good deeds, the even and respectable tenor of their lives, count as nought if once by any single act they depart from the usual course approved of by the world.

By such rule, or misrule, have princes and powers fallen; and we live in times but little changed from those preceding the French Revolution or the dark times of the English Commonwealth, when to hold passing conversation with the hated parties was to become a "suspect." We are hardly more tolerant now than then of the man who, on some point of mutual importance, thinks differently to ourselves, and judge him as wholly bad or quite mad on account of a different view taken of things, perhaps overlooking the fact we both have the same end in view, and both attain it, but by a different course. But what of all this? Well, I find that many a time I have practised, and do so every day, all kinds of photography, and make photographs of every character, mostly of the kind which is called sharply focused. I do this either because the subject or the purpose for which the photograph is required demands that rendering of exquisite detail and faultless delineation of parts which is alone possible by good photography.

It falls to my lot oftentimes to employ other photographers, and again and again I have to refuse and condemn work because insufficiently clear, bright, sharp in detail, and so on, so important in many cases are these particular qualities. I like, and heartily admire, a photographic print which makes me marvel at its beautiful execution, at its vividness, and wonderful redundance of minute detail. Such delicate work seems to me very pretty and very interesting, and I think I should only feel satisfied when the work shows the utmost perfection of craftsmanship which I think the circumstances admitted of. I sometimes see in shop windows an exceptionally good example of technical work and purchase it, and subsequently strive to imitate its good qualities, and hardly ever visit a strange neighborhood or famous place without purchasing one of the popular "opaline" views, and certainly pick out the one which is sharpest and clearest, because such publishers as Frith, Poulton, Valentine, Chester Vaughan, and others employ skillful workmen for this kind of work, and I know I can rarely do this sort of thing better myself, and so a shilling or two saves me the trouble.

This exquisite mirror-like rendering of objects is a quality with which we have grown so accustomed, that we are apt to pass it by without sufficiently thinking of its worth, and how poor our forefathers were without it. Nothing can appoach, still less compete with, photography in its magic-like rendering of every fibre and detail, its fascinating exactness, or in its rich translucence of surface, its finish, its fineness. It is a thing of marvellous beauty and a very pleasing display of skill, a thing most desirable for men to strive to do, and none more than myself feels inward pride and exultation when eagerly withdrawing the plate from its fixing bath, so impatient that scarce is the "fixing" complete, I find I have made a negative brilliant and clean, with every branch and grass stem clearly transparent in the nearly opaque surroundings—never a blur or indecision, no movement or indistinctness, bright, crisp, and satisfactory to the most exacting teacher of technique. Still more when from such plate the print is at last made, and every form and feature is so bright and distinct that finest pencilling could not come near such achievement, and each form and figure seems to stand forth as though nature were viewed through some wizard's glass. All this I say gives me immense pleasure, and when I see such work well done I am very glad, for of a truth really fine technical work is becoming rare.

Irreproachable technical photography is growing far more rare amongst amateur photographers because of a false notion that the most desirable thing to do so soon as one has mastered the elements of photographic practice is to make prints which at first glance have a passing resemblance to prints or pictures made by other means than photography. These amateur workers have somehow caught the idea that it is a good thing to counterfeit as closely as possible the work of brush or pencil, and the imitation in some cases being remarkably close it is assumed that the artistic value of the imitation is as great as the thing imitated in proportion as the one approaches indistinguishability from the other.

On this subject of imitation of styles and manner, I hope to say more anon, but for the present let me point out that whilst in some cases water-color very closely assimilates the appearance of oil painting, and the work may be highly esteemed as a work of art, yet we do not find it extolled purely because it is a juggler-like performance, artfully deceiving us into believing it to be what it is not. The production may be very admirable as a picture as carrying out the theme intended, and to do which the artist has thought fit to adopt a certain manner or style of working, but it is not the jugglery, the imitation of another medium, which constitutes or helps its claim to approbation.

Now I have in the foregoing uttered a strong expression of approval for fine, bright, technical work, and prefaced those expressions with a reflection upon the narrow-mindedness and intolerance of most people to-day, and my purpose is this:

I have made it a personal matter, I have put it as an expression of *my* approval, because I take it that there must be many, very many photographers who feel as I do in the matter. Out of some hundreds of plates successfully exposed, and prints satisfactorily made in the course of the year, probably 99 per cent. are of the character which would be termed *technically good*. For subjects, say they are such as a quaint building shortly to be demolished, or a country house visited of which I would preserve a memento, a friend whose likeness I would preserve (neither an Apollo in beauty nor possessing a head of leonine magnificence), and so in such cases I expose my plate and "do the rest," just as the Polytechnic student has been taught to do it, and strive to get a perfect photographic result, and I do this despite the fact that I know that there is to-day a prevailing fashion for putting things out of focus and taking things on dull, foggy days (or "fogging" the plate to produce the same effect). I say I do not care a fig for fashion, or what some say is right or wrong. I want a photograph of the country house which will show me every familiar feature, every blossom in the trim flower beds, each rosebud and leaf on the pretty trellis work, every stick and dot, so that I can look at it afterwards and have a whole page of memoranda which will remind me of my pleasant visit and the many happy incidents. Perhaps it is a view of some seaside place of sojourn, in which case I make or purchase a view in which I can point to a hundred objects, to some of which little stories attach themselves—there's the house I stayed in; that's my favorite seat on the Parade; there's the little shelter in which the old sailor stood and told me the yarns which I have since retold; there's where so and so occurred, and that's such and such a monument, and so on.

What is the good of saying, in consonance with the present fashion, that that is not good photography, it's just clever technique, and so forth? I say it *is* good photography, and remarkably useful photography, and a great deal better than many of us can do all at once, and whether it's just clever technieal work and merely topographical, matters not. I want a photograph of that kind, and why shouldn't I have it? Perhaps I would rather spend half a crown on a clever technical topographical view than on any other kind of photographic production. It all depends.

Then says some one, "Oh, but it's easily done; only follow the instructions and use a good lens, etc." I don't think it is easily done, at least not easy to do it well. Of course, a certain amount of good technique is not very difficult to obtain, but when I say well done, I mean the moment of exposure well chosen, avoiding some figure looming hugely in the foreground, or moving figure grotesquely placed or inconveniently blotting out some object of importance; the point of view intelligently chosen, so that no railing or lamp-post thrust itself upon the view. I am really inclined to regard selection of point of view as belonging more to technical work than artistic; if the houses are in shadow they must still possess every detail, and if objects are in bright sunshine they must still not seem harshly white nor too solid, nor showing halation.

Take all the technical faults and excellencies into consideration, and I say a really fine technical photograph is any thing but an easy and still less a despicable thing, and when I want a view of a place, I, and thousands of folks like me, want a good technical print; and so let us at once recognize that there is a place, and an important place, for technical perfection, and let us deplore that so many good and able workers are running after a sort of craze, a sort of fashion which entails poor feeble work which aims at little and represents nothing, and calls it "artistic." It is the prostitution of some of the wonderful and distinguishing qualities of photography without any gain and without any apparent intention to good.

That there is such a prevailing fashion none can doubt. One sees it on all hands—beginners who have only practised photography for a few months, those who have been at it for years. It preponderates at exhibitions and in competitions, and one wonders whether it would not be well to treasure up the few brilliant exceptions lest in a year or so what we still call the good technical photograph will have become obsolete.

Well, I have said that thousands like myself do periodically desire and are prepared to buy a clear, bright view of place or scene, so let us hope the demand will still survive to create the supply. By constantly exercising those powers which the ingenuity and investigation of physicists, opticians, and mechanics have given us, we may in time accomplish by photography quite undreamt of things, even color itself; but at least, greater rapidity, greater depth of focus, that is, a more equal distribution of sharpest definition in all planes, the rare beauty of platinotype, gelatino-chloride, and bromide of silver upon fine supports, such as porcelain and ivory, are all qualities which, by constant use, may be capable of immense improvement. Greater transparency in water in landscape, greater luminosity in sunshine, and an avoidance of the necessity of printing-in clouds, and a thousand other points, are all matters which should be kept in mind and advances made as opportunity offers, but in all these directions progress can only be hoped for if we constantly exercise our powers. When our average productions are on a par with the few exceptions of last year, then our exceptional examples may advance a step higher.

There is too prevalent a dilettanteism, too great an inclination to be content when moderate excellence is attained. We want more care, more dexterity engendered by practice, and the use, when possible, of only the finest apparatus and best materials, and also a full recognition of the qualities which have hitherto distinguished photography throughout the world, namely, accuracy in the delineation of details, rapidity in recording and in faithfully copying, and the production of a very complete or finished work with a disproportionate expenditure of labor.

Then, says a friend to me, "But what about the work you yourself show at exhibitions, and the works of others which I have understood you to believe in, and which yet possess no great crystalline clearness or rendering of detail?"

Just so! With regard to my own exhibited work, that is, so to speak, the one hundredth after the production of the ninety-nine. I mean to say that after producing a great amount of sharply defined, glossy, bright photographs, which correctly represent the objects portrayed, I say to myself, "I'll just see if this same photographic machine and process cannot be made to produce something altogether different. I'll just try if, by leaving out some of the very qualities which I admire in a good photograph, I can produce something of a picture, that is, something which shall suggest the sort of feelings which the original scene suggested, something which shall remind me of, not the place and the objects, but the sunlight, the breeze, the clouds, the shadows, the brightness, or solemnity of the scene, as the case may be. Of course, it will be quite useless for purposes of identification. I may not be able to recognize objects or point to familiar spots. *I do not want to, it is not the purpose for which I shall produce this "picture."* It is a kind of application of photographic means to a special end which I do for my own pleasure, and out of which I have found it possible to evolve certain rules and principles. But it concerns no one else, unless, indeed, some one says, "How do you do this sort of thing?" and, "Why, what is the immediate purpose of sacrificing certain valuable characteristics of photography."

Then I reply—I say, for the sake of distinction, we will call "this sort of thing" *Pictorial Photography*, and I find such and such ideas lead me to it, and such and such methods help me to produce these results. I do not call it photography, or the best photography, and do not advise everyone to take it up; to me it is very interesting, it produces a more lasting pleasure; I find others, too, seem to value it beyond good technical photography, and what is more amusing is that, like the *one* eccentric act which at the commencement of this article I said might brand me as a hopeless maniac, so the few "pictorial" photographs I have produced have branded me in the eyes of many as a lost "fuzzyist" who produces pictorial work because he can do no other.

Written a good deal about it? Of course I have, because many seem desirous of traveling the same road, and I fancy I can help them, and above all things I would strive very hard to help others to distinguish between good technical photography and good "pictorial" photography, *nor call examples of the former by the latter term.*

There are certain qualities which are essential to a picture, painted, drawn, or otherwise produced, qualities which must also be possessed by the applied photography which we call "pictorial photography," and it is to set forth these qualities that I take it most writers, like myself, strive to do both in writing and in our works; but what I would like to insist on is that the man who *wants* to produce a sharp-all-over-glossy-surfaced representation of a scene has a perfect right to do so, and is as sane as the man who suppresses focus and uses rough-surfaced paper if this latter individual chooses so to do.

I say "*as sane*," not *more* sane. Moreover if I or anyone else chooses to produce what we are pleased to call pictorial photographs in the way we think fit, and you, my friends, don't like them, well, I cannot help it, nor should you become angry with me for not ceasing such practice. I may try and convince you that there is sanity and good taste in these productions, until *you* forget that it is but one phase of photographic practice, and one which has somehow found such popular favor that others *ask for guidance*, but if *you* don't like it leave it alone, and those who produce it.

What is known as pictorial photography has become so increasingly popular amongst amateur photographers who are free to pursue their photographing just in accordance with their own tastes that, in one's efforts to meet the taste of one's readers, one is in danger of forgetting the all-essential technicalities of practice. That pictorial photography is the popular side to-day can hardly be doubted, and all are more or less imitating or acting under the influence of others. Whether those others are Dr. Peter the Great, or Hon.Sec. George the First, matters not, they were among the first in latter-day times who in applying photography to pictorial ends suppressed focus and adopted such like conventional methods, and got a good laughing at by those who are willing to praise; and to-day when one uses the expression pictorial photography, it is at once assumed that it is a generic term, including those productions which the unconverted call or called "fuzzy," and the wrangle and warfare rages over the question as to how and by what particular scheme of treatment a photograph may be pictorial or artistic. It is not a question as to whether all photographic productions should be sharp or the reverse. The most pronounced exponent of out-of-focus would probably visit such an exhibition as that now open at the Grafton Gallery, and heartily admire the minute delicacy of the miniaturist's art. Art? Yes, art, and art which the photographer vainly apes and never rivals, though he need not distrust his ability to vie in the mere production of minute detail. Strange, is it not, that even with miniature painting, which abounds so in the exquisite delineation of fine detail, that still the photograper, apart from the question of color, seems only able to feebly imitate, or if not imitate, produce something which cannot for a moment compete?

Indeed, I am not sure that as yet the photographer who throws over recognized methods and produces something which, even if like, is yet a long way behind brush or crayon work, is much nearer the accomplishment of art than he who makes the sharply drawn miniature his model.

Why then do I talk about photography as an Art? I don't—I was almost saying I never have, but at least, I have not said so, or thought so, for a considerable time past, and have taken every opportunity of trying to make myself understood on that point. I am not at all sure that photography will ever be able to claim complete recognition as art or an artistic means, but I do feel that when men who have taste and judgment in artistic matters have taken to use photographic means, and have used them regardless of what some one else says is the right or wrong way, they have ever and again produced certain effects—certain painter-like arrangements, which are eminently suggestive and often quite satisfactory pictorially, so that one feels that here is a phase of *applied* photography which is very interesting, very charming, and certainly worth cultivating, even to the extent of holding a separate and distinct exhibition, thereby concentrating attention upon this one peculiar and especial phase; and partly because of the singleness of object, and partly because the enthusiastic and most prolific and oldest practitioners of this particular branch contribute to that separated exhibition I have considered it the best and *most representative of its class*, but do not suppose for a moment that *for all the pictorial photographs in the world I am going to neglect or cease to practice* AT OTHER TIMES AND FOR OTHER PURPOSES what I may call *normal* photography.

Now, for the good of photography generally, and for myself in particular, I shall as often as possible point out the difference between the two kinds. It is essential that such difference should be pointed out. For why? Suppose I produce a sketchy little effect by means of dodging a negative, or printing from the wrong side, or any such unorthodox method, just because I had a fancy so to do, and someone seeing it, says, "Look here! This fellow calls himself a photographer!"—or, another time I produce for some special purpose a fine technical photograph, and someone, not knowing the difference, exclaims, "This is the work of a man who is an apostle of suppression of focus for pictorial effect. I do not see much difference in this. If this is pictorial photography, I think I can do this!"—is it not important that the difference should be pointed out; *the difference of motive which has led to difference in treatment*, and then keep the two as far apart as possible?

I do not think that sharply rendered detail is conducive to pleasing pictorial effect. It is as though there were too much Nature in it, and Nature and Art, I need not say, are anything but the same; indeed, I am not sure that it would not be truer to say Nature is the antithesis of Art, though it will perhaps be time enough for the photographer to discuss that question in the next century. For the present it is enough to recognize that the mere copying of Nature is not Art, and it is probably the ready copying power of photography which has retarded its progress in artistic directions.

It is all very well to say that photography is so wondrously able to render atmosphere and haze, etc., but I am not sure that the mere correct portrayal of atmosphere or haze is any better than the mere portrayal of trees and flowers; they must after all be equally included in the list of physical facts, parts of Nature which of themselves and for themselves are valueless from the artist's point of view. If, however, such objects of Nature as mist and haze, and the indecision lent by the enveloping atmosphere, better enable us to produce a pleasing impression by our picture, then of course we take advantage of these conditions legitimately.

I like to think of the artist as a man who wants to produce a pleasing design or figure, who wants to describe with pencil or other tool a form which, when looked upon, shall give delight, just as subtly blended curves and undulating lines may, and so he finds the primitive human figure most suited to his purpose.

Thence developing his means of expression, gradually he finds other objects in nature are when outlined, pleasing; next come form and masses, and then color, and now when the artist would give us a picture which shall please, he draws upon nature to supply the forms and figures and combinations of colors and tones.

Romantic? Well, no, perhaps an idle fancy, but somehow I feel that if I move a piece of opaque paper backwards and forwards in a curve over a piece of sensitized paper, and so produce a sort of finely graduated curve of shadow, which would simply give the eye pleasure as a delicate tint and a curved figure, I am not sure that it would not be more truly artistic than anything ever produced by camera, lens, or plate; but this is a more abstruse aspect of art in relation to photography, and in a mere chatter, such as the present, I do not propose to sift it. Suffice it for the present to say that the pictorial application of photography is, as far as I personally am concerned, a mere side application, interesting in itself, and still more interesting in its suggested possibilities; but to run away with the idea that photography having on occasion accomplished a very close resemblance to the painter's art is therefore to be recognized as art is absolute folly. And if I say frankly what I feel respecting the recent exhibition in London, which confines its attention to pictorial work, and of which I can speak in high praise, *as a whole*, I should say that it probably did not include more than three works which were wholly satisfactory as works of art, as artistic achievements, not pictorial photographs, because whilst hitherto we have been rather too loosely using the term pictorial as synonymous with art, I perceive the growing need of differentiating between picture-making and art. For my own part, although an indifferent draughtsman or painter, I believe had I attempted to paint or draw what I have elected to produce by photography there would have been more art in the result if less general pictorial satisfaction.

Mad? Pardon me, sirs, I am not mad, but as sane and almost as alive to the requirements of an intelligent public as the late Sir Augustus Harris, but with just some desire to convert others to my way of thinking; but as regards the, to some folks, vital question of focus, I am very much attached to *f*/32 and *f*/45, and the stops are becoming quite shiny from frequent use, but looking at it from a very sordid point of view the out-of-focus things fetch the largest prices. I do not find anyone who will give three or four guineas for a 15 by 12 sharply-focused view, printed on gelatine paper, but there are many, very many, who will purchase at that price a 15 by 12 photograph, pictorially treated and with hardly one feature which can be called typical of good photography. But that's only one way of looking at it.—*The* (*London*) *Amateur Photographer.*

* * *

"The young student should in the first place acquire a knowledge of perspective to enable him to give every object its proper dimensions, after which it is requisite that he be under the care of an able master. . . . Next he must study nature in order to confirm and fix in his mind the reason of those precepts which he has learnt."—*Leanardo da Vinci.*

NATURALISTIC PHOTOGRAPHY. BY P. H. EMERSON, B.A., M.B. (CANTAB).

CHAPTER III.

(*Continued from page 552*)

Phenomena of Sight, and Art Principles Deduced Therefrom.

It will be well now to inquire on scientific grounds what the normal human eye really does see; for our argument is, that a living being does not see things as does the photographer's lens. That the impression will vary with individuals, there is no doubt, for the artist will see subtleties never dreamed of by the commonplace or uneducated eye, and his aim will, of course, be to portray those subtleties in his picture, and hence one source of individuality in a work, another being in the way in which it is done, and a third the inherent difference between artists. Our task now shall be to examine into the physical, physiological and psychological properties of sight, and to arrive at a conclusion, in so far as science allows us, as to how the normal eye does see things. The student will do well to read Chapter II. of Book III. of Dr. Michael Foster's "Text Book of Physiology," as well as the matter on the eye in Ganot's Physics, before going any further in this chapter, for we do not wish to go over ground which has been occupied previously, our aim being to give a view from the artistic standpoint of the physical, physiological, and psychological properties of eyesight. We will, then, proceed to consider how well we see external nature, that is, within what limits, for we never see her exactly as she is, as we shall show.

To begin with, then, the retinal nerves are strictly reserved to respond to the vibrations of ether—called light. If the student has ever had a blow on his eye, he has probably *seen* "stars," because every stimulus to this pair of nerves makes us see things, and not feel them. Now each sense has certain limits between which it can detect subtle vibrations, but beyond which all is blank. The more refined the organization of the person, the greater will be the number of vibrations he can distinguish. Thus 399,000,000,000 vibrations in a second produce in us the sensation of light; above this the vibrations appear as spectral colors until the number 831,000,000,000,000 is reached; to an increase in the number of vibrations above that number the optic nerve does not respond. Now the eye is an optical apparatus fixed between the brain and the ether, not that we may perceive light, for we could do that without the eye but that we may distinguish objects. The glyptic and pictorial arts are based on the sensation of light, on the sense of sight as music is founded on the sense of hearing. In the pictorial arts, then, we must clearly distinguish between the physical, physiological, and psychological properties of sight.

A. LIGHT.

I. Physical characters of the eye as an optical instrument.

If a ray of light passes through a small hole into a darkened room (pin-hole camera), an image is formed of the object or objects without. The condition of a good definition of the image is that "all the rays from each point on the object must be carried to its own point on the image." If this hole be enlarged, this condition is impossible, and the light spreads over certain areas called diffusion areas or diffusion circles. In other words, widely divergent rays and contiguous rays become mixed. To admit more light a lens is used in the eye, and by the photographer, for although it is possible (by pinhole camera) to take pictures without a lens, the light so admitted is necessarily so limited that the exposure needed is too long. The lens, however, helps us by admitting more light, and at the same time giving better definition, but it also introduces many disadvantages and renders things as we do not see them. Now a *theoretically* perfect physical image has been described by physicists as being both bright and sharp in definition, but the theoretically perfect image does not exist; for, apart from other considerations, the lens which we use to get microscopic sharpness amongst other things, cuts off light, and the sharper the image is rendered by stops, the less relief do we get.

In the human and photographic lenses the chief theoretical faults are:—

Dispersion. All refraction or bending of light by a lens is accompanied by dispersion. This error is corrected in opticians' lenses to a great extent. It is slight blurring of the sharpness of outline, since the size and position of the optical images thrown by the differently bent rays is not the same.

A lens having a spherical surface bends the rays so that they do not all come to a focus at the same point. What is the effect of this on our theoretically perfect image? Again it is slight blurring of the sharpness of outline. It is said the spherical aberration in a perfectly corrected optician's lens *is less than that in the lens of the human eye*. From this it is highly probable that the chromatic aberration is less in the perfectly corrected lens than in the eye. This must be remembered in connection with our later remarks. In the lower animals, spherical aberration is nearly absent. Their vision therefore is more periscopic, and therefore more like that of an optician's lens.

This defect can be avoided in the optician's lens, but it exists in, and is a serious fault of, the human eye. It is, however, found in many opticians' lenses, and is one cause of false tonality.

Helmholtz considers the amount of spherical aberration unimportant as compared with this defect. Astigmatism is the result of imperfect centering of the cornea and lens. This defect is found in most human eyes.

Astigmatism prevents the eye seeing vertical and horizonal lines at the same distance perfectly clearly at once. The defect in centering also causes irregular radiation, so that, as Helmholtz says, "The images of an illuminated point as the human eye brings them to focus, are inaccurate." What is the effect of those defects on the "perfect image"? Dimness of outline and detail in the textures of objects seen.

The optician's lens is made of pure glass, the media of the human eye are not clear, but slightly turbid, so that Helmholtz says, "The obscurity of dark objects when seen near very bright ones depends essentially on this defect.

This defect is most apparent in the blue and violet rays of the solar spectrum; for then comes in the phenomena of fluorescence to increase it." By fluorescence is meant the property which certain minutely divided substances possess of becoming faintly luminous, so long as they receive violet and blue light. The bottles filled with solution containing quinine, which look blue in the chemists' windows, owe their color to this fact, as also does the blueness of "London" milk. These defects, combined with entoptic impurities which are constantly floating about in the humours, all help to detract from the brightness and sharpness of the "perfect image."

This is a portion of the retinal field with no cones or rods, and therefore insensitive to light. This causes a gap in the field of vision. "This blind spot is so large that it might prevent our seeing eleven full moons if placed side by side, or a man's face at a distance of only six or seven feet," says Helmholtz. In addition to this, there are lesser gaps in the retinal field, due to the cutting off of light by the shadows thrown by the blood vessels. Any one who has examined the retinal field with an ophthalmoscope knows what this means.

In addition to this the *macula lutea* is less sensitive to weak light than other parts of the retina. The effect of all these imperfections is to blur and dull the perfect image. The serious defects due to the blind spot are not noticed, according to Helmholtz, because "we are continually moving the eye, and also that the imperfections *almost always affect those parts of the field to which we are not at the moment directing our attention.*" The italics are ours. Here, then, is another great difference between the eye and the optician's lens.

The focus of the eye in a passive state is adjusted to the most distant objects. It focuses for nearer objects by contracting the ciliary muscle which pulls tight the zonule of Zinn and so curves the crystalline lens. It can focus thus up to within six inches of itself, but the changes of focus are almost imperceptible to the eye beyond twenty feet. Now a *theoretically* perfect eye might form perfect images of objects at infinite distances when there were no intervening objects. But as has already been shown, the eye is theoretically imperfect, and its images are not therefore perfect, and it could not form theoretically perfect images, even if the atmosphere were pure ether and nothing else, for there are other facts in nature which prevent this; thus we cannot see a sharp image of the sun with the naked eye on account of its dazzling brightness.

This central spot is a most important factor in the study of sight and art. For though the field of vision of the two eyes is more than 180 deg. laterally, and 120 deg. vertically, yet the field of distinct vision is but a fraction of this field, as we can all prove for ourselves. Now the field of distinct vision depends on the central spots for the reason that the central spot differs anatomically from the rest of the retina by the absence of certain layers which we need not specify here. The absence of these layers exposes the retinal bacillary layer to the direct action of light. Helmholtz says "all other parts of the retinal image beyond that which falls on the central spot are imperfectly seen," so that the image which we receive by the eye is like a picture minutely and elaborately finished in the centre, but only roughly sketched in at the borders. But although at each instant we only see a very small part of the field of vision accurately, *we see this in combination with what surrounds it, and enough of this outer and larger part of the field, to notice any striking object, and particularly any change that takes place in it.*" If the objects are small, they cannot be discerned with the rest of the retina, thus, to see a lark in the sky, Helmholtz says it must be focused on the central spot. Finally he says, "To *look* at anything means to place the eye in such a position that the image of the object falls on the small region of perfectly clear vision. This we may call *direct* vision, applying the term *indirect* to that exercised with the lateral parts of retina, indeed with all except the central spot." Again, he says, "Whatever we want to see we look at and see it accurately; what we do not look at, we do not as a rule care for at the moment, and so do not notice how imperfectly we see it." Taking the distance between the two central spots at 3 inches it follows from

MARSHY MEADOWS BY H. TROTH

proportion that we must have an object six inches to see it; this, then, suggests the limits of the angle of view we may include from our point of sight. Now all this is most important in connection with art, as we shall show later; we must beg the student therefore to hold it fast.

(*To be Continued.*)

DIGRESSIONS. THE PICTURESQUE AND THE BEAUTIFUL.

BY H. P. ROBINSON.

THE picturesque and the beautiful are the chief materials on which the pictorial photographer exercises his art. As "music is the food of love," the qualities about which I am to discourse are the food of the artist. The other artistic emotions (except the merry ones), such as sublimity and terror, are perhaps beyond the power of photographic expression. Possibly the time may come when our friend the scientist will supply us with a louder thunder and a more vivid lightning; we will then endeavor to wield them with pleasure, and who knows? we may reach the sublime. It is to be hoped that the lower qualities, from which the exaggerated impressionist used to draw his inspiration—such as it was—the ugly and the sordid, the music hall and the coster, will cease to exist as a subject for art treatment.

At the end of the last century and the beginning of the wonderful one we are now bringing to a conclusion, the relation of the picturesque to the beautiful was a favorite subject with authors who belabored each other with much amiable ferocity. Witness Alison on *Taste;* Burke, on the *Sublime and Beautiful;* Knight's *Analytical Inquiry into the Principles of Taste;* Repton's *Letters;* Price on the *Picturesque;* Gilpin's *Essay on Picturesque Beauty;* and many others. These books, some of them portly volumes, referred principally to landscape gardening, but, to get at where to plant a bush it seemed to be necessary to review all art from the beginning, and, in designing the plan and elevation of a shed, it appeared desirable to discuss the Great Wall of China, the pyramids of Egypt, the colonnades of Palmyra, and the aqueducts of Rome; therefore we have in this field of literature a good deal of "fine confused reading" which I shall probably make use of as I go on. I may, perhaps, as well mention that Downton Woods andthe Hay Mill, near Ludlow, known to many photographers, are the result of the experiments and planting of John Payne Knight, the author of the *Inquiry*, who owned the castle and estate about a century ago.

It is possible there are some who are not able to recognize much difference between the picturesque and the beautiful, and others compromise the matter by talking of the picturesque beauty of a scene. There are few words whose meaning has been less accurately determined than the word "picturesque," and, in the language of America (which is derived from the English), I am not sure that it exists at all, certainly not with the same spelling. But there can be no doubt that picturesqueness is a very real and distinct quality.

The word was originally applied to every kind of scenery or object which had been, or might be, represented with good effect in a picture; but it has long since acquired a more extended meaning. Thus we have picturesque language, and many things we now call by the name which are quiet unpaintable.

The picturesque has a character not less separate and distinct than either the sublime or the beautiful. The difference between the three qualities may be broadly described as—the picturesque, rough, or rugged, or irregular; the beautiful, graceful; the sublime partakes more of grandeur and awe, but may be dismissed from present consideration as not being within the limits of our art.

The words "picturesque" and "beautiful" would cover the greatest and best qualities a photographer could desire to get into his pictures, and to have a clear idea in the mind of what these qualities are and their causes would be a great help to their attainment. We will now, therefore, attempt to throw together a few ideas of what picturesqueness really is.

Roughness, or ruggedness, joined to irregularity, are the most efficient causes of the picturesque.

This will appear clear if we take a view of those objects, natural or artificial, that are allowed to possess the quality, and compare them with those which are allowed to be beautiful.

For instance, there has just passed down the road a family of hoppers: it is raining steadily with the persistence of an autumn that follows a rainless spring and summer. The miserable father and mother and wretched children are a sad sight. Nothing could be further from the beautiful, but they are very picturesque. As a contrast, a charming young lady, adorned for her first important ball, may be beautiful, but, even if not charming, she could not be picturesque, although she may be very paintable, or make a delightful photograph. It must not be understood, however, that misery, as in the case of the hoppers, was necessary to picturesqueness. The most picturesque model I ever had was certainly the most jolly.

Now for an example from landscape architecture. A temple of Grecian design in its perfect state, either in painting or reality, may be beautiful; in ruin it is picturesque. Time usually converts a beautiful object into a picturesque one. Whether stains, lichens, partial incrustations, mosses, break up uniformity of surface, give a degree of roughness and variety of tint; variations of weather crumble stone, and give a degree of ruggedness; the primness of beauty deserts the object, and gives place to the picturesque. A geometrically planned garden, with smooth turf, nice trimmed walks and shrubberies, may possibly be beautiful, but could never become picturesque until it was neglected, overgrown with wild plants and creepers, and ivy mantled the statues and fountains.

Symmetry and regularity accord with beauty, but are adverse to the picturesque, and among the causes of the superior picturesqueness of ruins, compared with entire buildings, the destruction of symmetry is by no means the least powerful.

The origin of most of the picturesqueness of the world, from the humble cottage up to the highest Alps, is decay. It is also the cause of much of the best poetry. The contemplation of death, and especially the approach of death, seems to be eminently adopted for producing that pleasing melancholy which is certainly poetical, and seems to have a charm for most people. Poets dwell more on the sadness of parting lovers than on their meeting; jocund day standing on the mountain-tops may be occasionally mentioned by the poet, but he touches the feelings with a more thrilling sensation when his theme is a sunset. Why people should prefer to be touched to "the sacred source of sympathetic tears" as the highest form of pleasure, rather than be

> "A happy soul, that all the way
> To heaven hath a summer day,"

is too tremendous a question for me to consider here, but there can be no doubt it is a fact. In our small way, nearly every exhibiting photographer found that out for himself a few years ago, or, unhappy thought, did he purloin the idea from his neighbor? and we were deluged with dying-days, mellow eyes, twilight musings, rising mists, and midsummer nights. One effect was that suitable quotations from the poets were driven to a premium.

Now, I have not a word to say against this melancholy movement, except that we have had too much of it, not of the true kind, but of the inferior imitation; indeed, I very heartily applaud it. Anything that tends toward poetry in a photograph is to be commended. The difficulty came in, as usual, with the uninspired imitators. They seldom went to nature to find poetry for themselves, or to absorb the feeling with their own souls; they went to find something like that subject of their neighbors, because they thought they could do it as well. That mine was full of nuggets, but it has panned out. We want another general subject now. Cannot we do something with mid-day or even afternoon? If one or two would do something beautiful that looked easy, there would surely be plenty of followers. Milton made as good poetry out of *L'Allegro* as *Il Penseroso*, though it has always troubled me that he gave foreign titles to these two delightfully English poems—an affectation that has never yet died out.

In photography it is so difficult to be original, so easy to "level up," or seem to do so. Not only in single pictures, but in whole exhibitions, imitation is rampant. As it is probably all for the good of photography, and may possibly, in the future ages, lead to something more original, I am, indeed, proud to see my own pet child, the Salon, imitated in every item of outward dress, the cut and fashion, even to the numbers hung and the arrangement of bays they are hung in, the body but, unfortunately, not the soul, by those who once did not wish it well, reminding us of Tennyson's playful little verses:

> "To and fro they went,
> Through my garden bower,
> And, muttering discontent,
> Cursed me and my flower.
>
> "Then it grew so tall
> It wore a crown of light,
> But thieves from o'er the wall
> Stole the seed by night.
>
> "Read my little fable;
> He that runs may read;
> Most can raise the flower now,
> For all have got the seed."

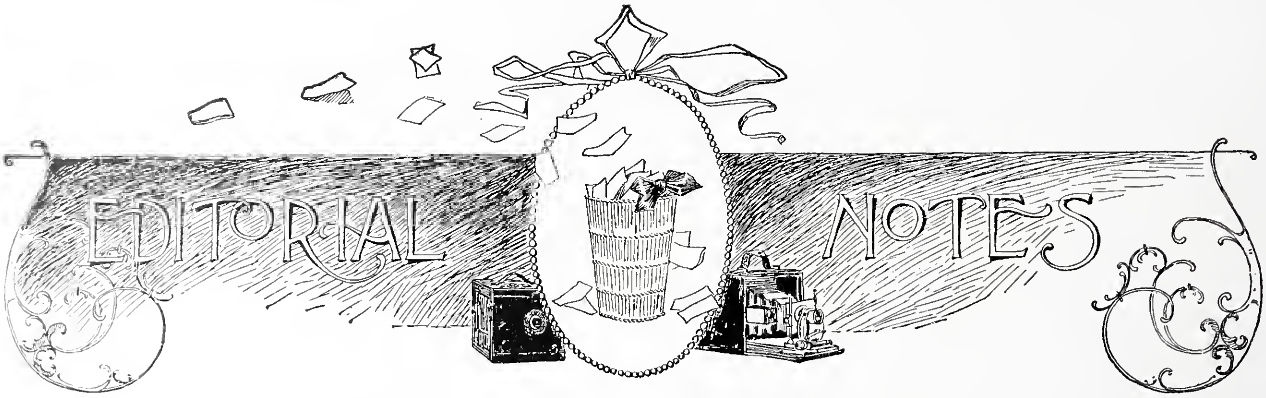
But I am running away from my subject in my usual reckless way. It is well I headed these poor essays "Digressions."

Beauty is the so much more enchanting and popular quality that the word "beautiful" is often wrongly applied as the highest commendation to whatever gives us pleasure or raises our admiration, be the cause what it will. The ordinary human being seldom uses the word "picturesque;" it is always beautiful, if, indeed, it is not jolly, heavenly stunning, or one of those slang terms that of late years have been added to the vocabulary of the worshipers of the beautiful.

The power of beauty has been the theme of the poets for ages. Beauty has a different effect on different people; the appearance of things depends very much on the mind of the beholder, as also does the effect. When Milton's Satan, first saw the beauty of Eve, he was struck "stupidly good." A good phrase, but the effect was but transient. With many people beauty consists of only "what is worn." Yesterday I met a daughter of Eve with a structure on her head made of swan's wings, set upright, with an outward leaning, a sort of imitation of King Arthur's helmet, on which "the dragon of the great pendragonship blazed." However preposterous this wonderful construction appeared to others, it is easy to conceive that she thought it beautiful. Fashion, even in the worship of the beautiful, changes, and we are almost compelled to acknowledge, with the poet—

> "There's no such thing as that we beauty call;
> It is mere cozenage all;
> For, though some long ago
> Liked certain colors mingled so-and-so,
> That does not tie one now from choosing new.
> If I a fancy take
> To black and blue,
> That fancy doth it beauty make."

—*The British Journal of Photography.*



EDITORIAL NOTES

The success of our Annual is not only gratifying but decidedly encouraging. As we go to press the entire edition is almost completely exhausted. The comments upon its contents have been very flattering. It is, of course, a very difficult task to please everybody, but we have endeavored to so vary the contents that everyone will find something of interest or value to him, and while you, reader, may find one or two things in the book that are not to your taste, yet you must remember that they may possibly be very welcome to others.

= = = = =

With this issue we commence Vol. XXIX, and if you are not a subscriber to this magazine we would suggest the advisability of sending in your subscription at once so as to secure the complete volume. A form for the purpose will be found among the advertising pages. We intend to make the present volume far in advance of its predecessors.

= = = = =

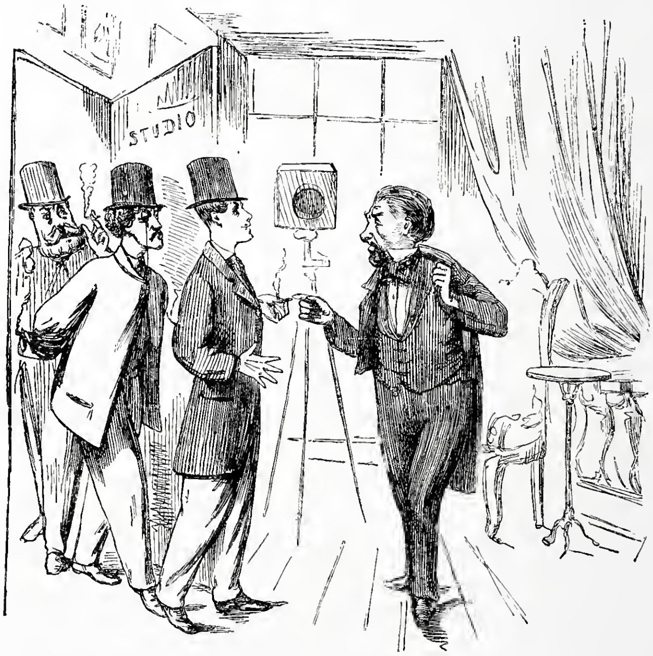
Mr. W. N. Jennings, a valued contributor to these pages, is at present in London, where he will remain for at least a year. He will associate himself with Mr. F. E. Ives in the management of the Photochromoscope Syndicate, Ltd. This is a syndicate formed for the purpose of manufacturing photochromoscopes, an invention already described in these columns.

= = = = =

Mr. Paul, the animatographer, tells rather an amusing story of how he secured his negatives for the animatograph pictures of the Czar's visit to Versailles, now being exhibited at the Alhambra Music Hall in London. Every effort was made to obtain permission, but the police would not listen to any proposal for the erection of the camera on the route. Mr. Paul accordingly hired a window for 500 francs, and employed a lady to stand in front of the camera so as to mask it until the critical moment. When the procession approached the lady stepped on one side and Mr. Paul rapidly took the series of photographs, to the horror of the *gendarme* who had brought him the refusal of the authorities, and who was wedged in the crowd on the opposite side of the street. As soon as the Czar had passed, Mr. Paul picked up his camera, dashed down stairs into the garden, where (we must believe) he buried the camera, and then got away from the house by back streets. The police came after him, but found nothing, and Mr. Paul was enabled to return at night, dig up his camera, and come to London with his impressions safe.

= = = = =

It is not generally known, perhaps, that the first drawing published in *Punch* by Du Maurier, the artist and author of "Trilby," illustrated a joke on the photographer. By the kindness of the editor of *Book News*, an interesting little magazine on books and bookmen published by John Wanamaker, we are enabled to give a reproduction of this drawing.



Photographer. "*No Smoking here, Sir!*"
Dick Tinto. "*Oh! A thousand pardons! I was not aware that——*"
Photographer (interrupting, with dignified severity). "*Please to remember, Gentlemen, that this is not common Hartist's Studio!*"——[N.B. Dick and his friends, who *are* Common Artists, feel shut up by the aristocratic distinction, which had not yet occurred to them.]

From *Punch*, October 6, 1860.
Du Maurier's first drawing. The first figure is the artist himself and the second, Whistler.

FRED COOP

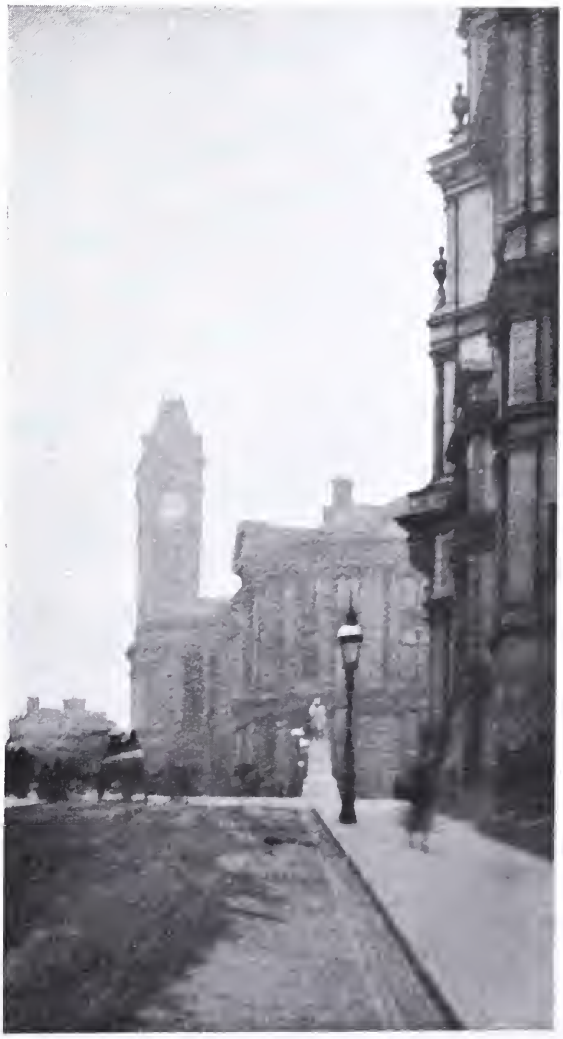
Although quite a young man, as will be seen from the portrait herewith, Mr. Fred Coop is one of the few successful photographers in England to-day. In reponse to our request he has sent a number of beautiful specimens of his work. Reproductions of these will be found in this number. Mr. Coop sends us the following description of them:

"Above the Valley Mists," is a picture made possible only by the kindly fog or mist which reduced the hard distance into a softness, which I made an effort to picture. and I also fancy there is a downhill feeling about the foreground which is very difficult to obtain satisfactorily. The ivy-covered church, barely decipherable in the distance, yet standing out stronger among the mistier surroundings, requires accentuation with the brush, which I am not afraid to use when I think proper, although some workers consider it very, very wrong.

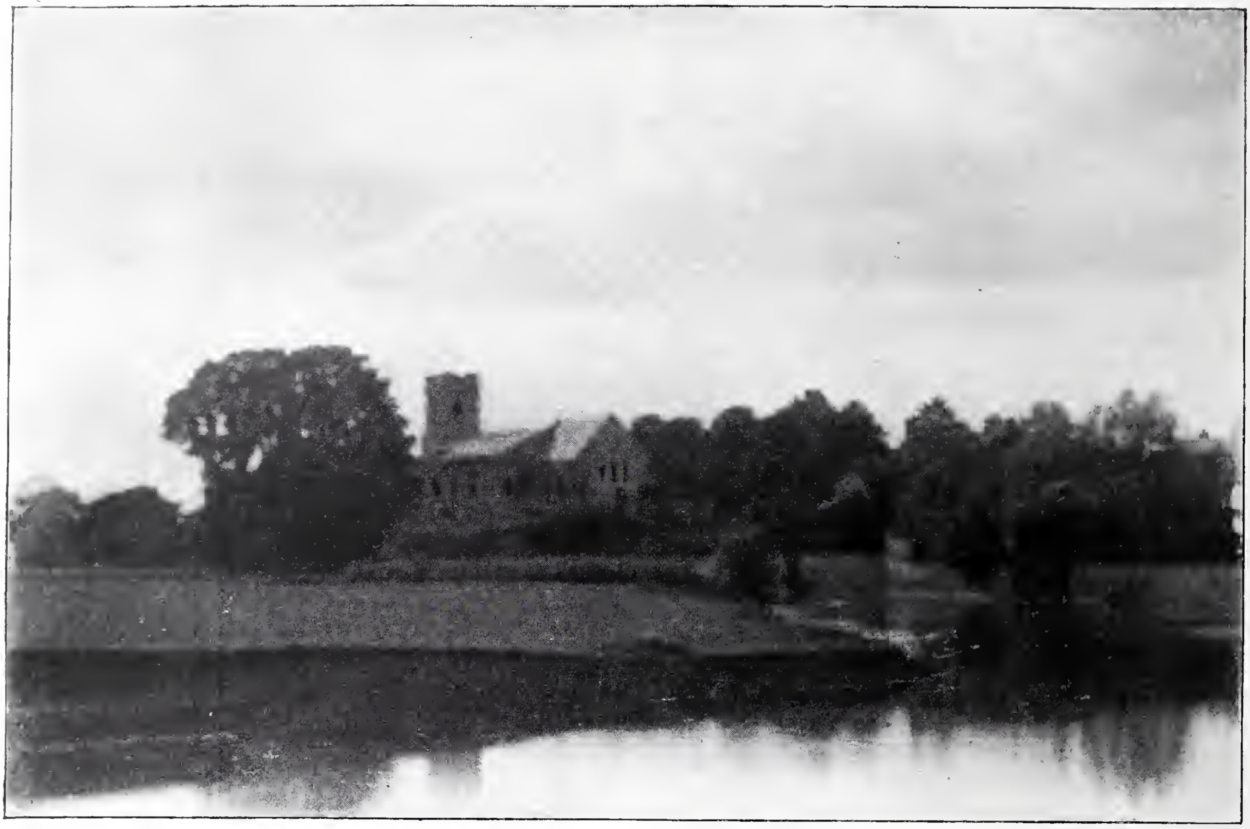
"Come Along," is a picture made out of firstly, of course, the figures, some wild dead dog daisy from a garden at home, brought purposely, and hard, clear-cut houses and heaps of refuse; pailings for a background. In fact, the situation was a ledge of grass—with on the right the railway and on the left a free tip. And yet I venture to suggest that by subduing the ungainly distance and thus rendering it soft and not so severe to the eye, it has brought the principal object into greater prominence, and the picture as a whole, may have some pictorial value.

"A Bye Road at Evening." An endeavor to render a subject, in itself not finely balanced or well composed, which, after the sun had set some time seemed to fall into masses which were pleasing—the district being "Machynllesh, North Wales."

"Early Morn, Dovey Valley," was one of the results of rising at 4 o'clock in the morning and trudging by the River Dovey for several miles through the dewy grass in company only of my hand camera. The high light



COUNCIL HOUSE BIRMINGHAM
BY FRED COOP



BEDFORD CHURCH BY FRED COOP

COME ALONG BY FRED COOP

is strengthened by the dark mass, contrasting with it, and at the same time centering the interest. The other results of this peregrination referred to were two wet feet and one bad cold. However, I was satisfied, and thought the game worth the candle.

"The Inner Harbor, Aberystwith." The pictorial qualities of this picture would have been greatly enhanced if the rope mooring the boat had been brought in shape back to near the right hand side of the picture. But this was impossible. The interest is well centered on the boat by the coincidence of light.

"Bedford Church." The town of Bedford was immortalized by Shakespeare. He called it Drunken Bedford, and not without cause, perhaps. People here at the age of 60 keep their grandparents. Having one day asked an old man how it was the people lived so long, he summed it up as follows: "Woi, sir, if yer eats 'ome made bread and drinks 'ome brewed beer, yer ken live as long as yer 'd a mind."

"Council House, Birmingham." This, I fancy, may be appreciated as representing the contour of the subject with some originality.

ABOVE THE VALLEY MIST
BY FRED COOP

A WELSH LANDSCAPE BY FRED COOP

The building in the foreground is portion of the new post-office, and the atmospheric effect caused me to take the opportunity of portraying this pictorially difficult subject.

"A Welsh Landscape." The lines and masses formed by the wall, road, and bank all satisfactorily lead the eye to the principal portion of the picture. This subject seen under different lighting appears very weak, and lacking altogether in artistic composition. I fear these remarks are rather disconnected and rambling, but you, my reader, will do the necessary filling up and destructive criticism. One word of advice or help: "I would advise you, if you strive after producing real, good pictures, to pay a great, yes, a very great, deal of attention to, first, lighting; second, atmosphere; and thirdly, good composition. Perfect composition is weak unless well lighted, but good lighting makes much out of little. Don't be afraid to subordinate, by focus or what not, anything and everything to the principal object."

* * *

The question as to whether a plate can be fixed in actinic light without detriment to the image is discussed by a writer in *Das Atelier des Photographen*. He refers to the results of his experiments as follows:

"If a plate, after development, is carefully washed with weak hydrochloric acid, and afterward in pure water, and is then cut in two, one half being left in the dark-room, while the other half is exposed to daylight, under water, a marked difference will be perceived when the two halves are placed in the fixing bath. The unexposed plate fixes much quicker than the other. The same thing happens if one half is fixed in the dark-room while the other is fixed in the light. In the end, however, both plates have much the same appearance, the one exposed to light often being a little denser. After washing, exposure to light will change neither of them. If the developer is thoroughly washed out, the exposure to light is perfectly harmless, provided that it is not of too long duration. The result is, however, different if the washing has been imperfect. A plate that was developed with rodinal, slightly washed, and exposed to light for a short time—insufficient for the developer left in the film to exercise any reducing action—behaved strangely in the fixing bath. In the first place the fixing process was much prolonged, then it did not appear to fix out completely and an intense yellow stain appeared. This yellow stain also appeared on bromide

THE INNER HARBOR AT ABERYSTWITH BY FRED COOP paper. Plates and paper treated in this way cannot be intensified with mercury. When placed in the mercury bath, even after hours of washing, the action is found to be uneven, and a terrible yellow stain is formed. These results were much less marked when iron was used as the developer."

= = = = =

THE following amusing story of the late Sir John Millais is worth repeating:

One day while Millais was engaged in painting his famous picture, "Chill October," among the reeds and rushes on the banks of the Tay, near Perth, a voice came from over the hedge:

"Ma-an, did ye never try photography?"

"No, never," replied Millais, painting slowly.

A pause. "It's a hantle quicker," said the voice.

"Ye-es, I suppose so."

Another pause. The final thrust was: "An' it's mair liker the place."

= = = = =

A BYE-ROAD AT EVENING BY FRED COOP

R. W. BUTTEMER, in *Photography*, gives the following instructions for making a fluorescent screen: Brush over a piece of black card with gum, and sift the salt over it. I have used this method with calcium tungstate (scheelite); but this salt, though brilliant, phosphoresces as well as fluoresces, thus giving a foggy image after a few consecutive trials. Or, mix the powdered salt with collodion (flexible, *i.e.*, containing a percentage of castor oil), and coat the card or aluminum foil with it. I have found this method most successful with barium platino-cyanide on aluminum foil. Or coat the card or foil with dilute flexible collodion, and sift the salt over it. I have used this method with Melckebeke and Van Heurck's fluorescent salt, which appears to be an organic salt of uranium. But in all cases success depends on finely powdering and sifting the (carefully dried if necessary) salt. I use 120 to the inch.

EARLY MORN, DOVEY VALLEY BY FRED COOP

= = = = =

WE have always advocated simplicity in development, and cannot resist a smile when we see a formula given like the following:

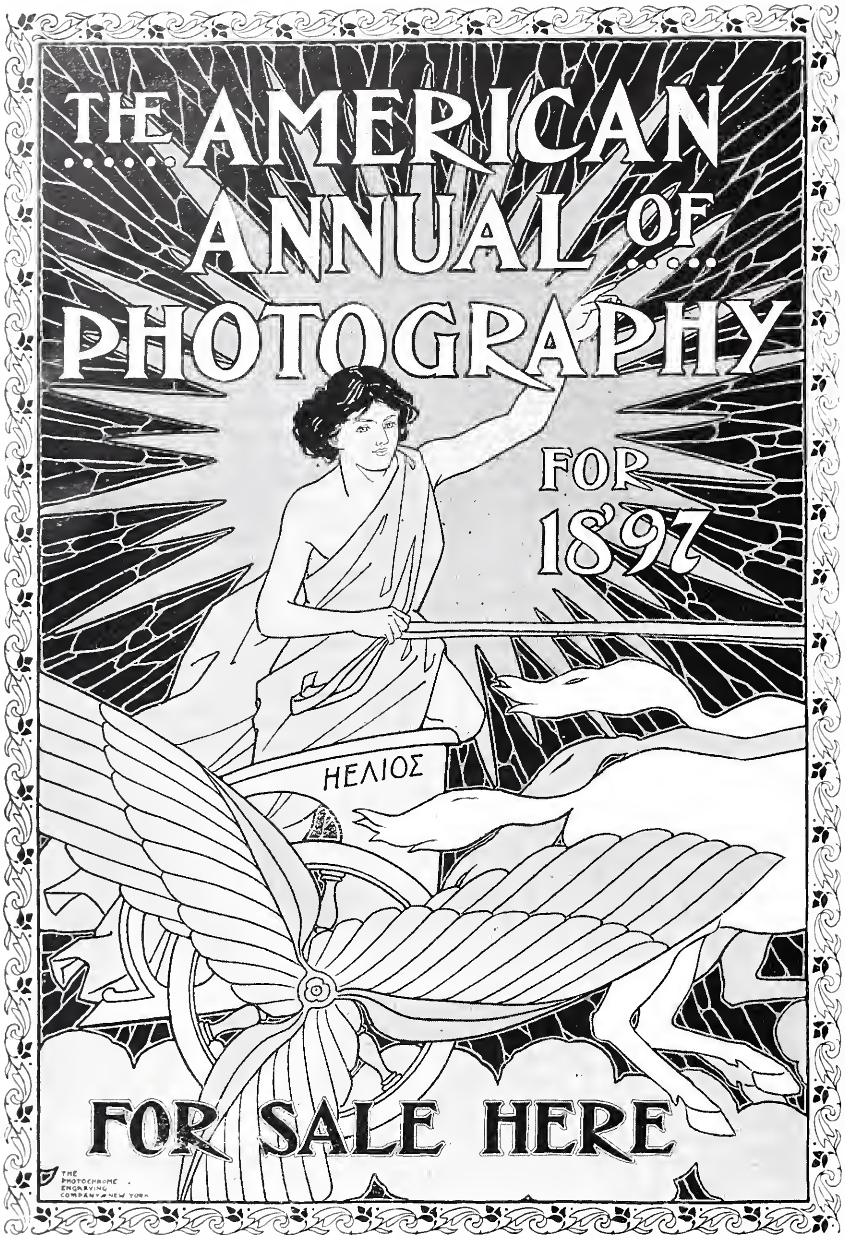
Boiling water	1000 parts
Sodium sulphite	120 parts
Hydroquinone	15 parts
Eikonogen	10 parts
Yellow prussiate of potash	20 parts
Carbonate of potash	75 parts
Caustic potash	15 parts
Bromide of potash	1 part
Glycerine	5 parts

For use, dilute with half volume of water.

A Frenchman, Dr. Decaux, is responsible for it, and it is said to be a good all-round developer. No doubt it is. Possibly the worthy doctor has so arranged his formula that if some of the ingredients do not act satisfactorily the others will.

= = = = =

"OUGHT not sound criticism to look to results only, and to disregard the means employed, and the precise amount of difficulty overcome in producing them? I think that a careful study of the work of painters, so far as composition is concerned, will show that pictorially the photographer may justly claim far more latitude in the choice of subject and the way of representing it than many fancy themselves entitled to, and a result of realizing this fact and acting upon it, would introduce a greater variety in the work produced by camera and lens—a result to be devoutly wished."—*Rev. T. Perkins*, in the *Amateur Photographer*.


THE AMERICAN ANNUAL OF PHOTOGRAPHY
FOR 1897
ΗΕΛΙΟΣ
FOR SALE HERE
THE PHOTOCHROME ENGRAVING COMPANY NEW YORK

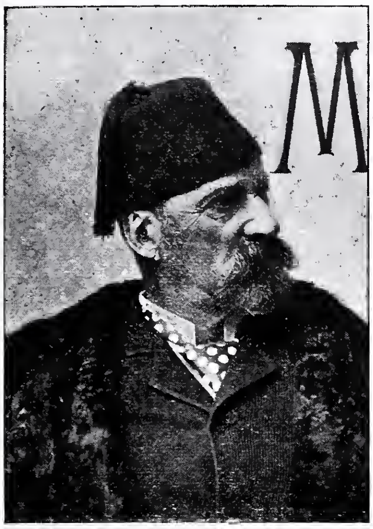
We have received many letters congratulating us upon the attractiveness of our poster. For the benefit of those who have not seen the design we give a reproduction herewith although, of course, we are unable to show the artistic coloring. The design is by a well-known artist, and the printing and engraving the work of The Photochrome Engraving Co. For the benefit of poster collectors we have reserved a small quantity, one of which we will forward to any address on receipt of 25 cents in stamps.

= = = = =

On another page will be found a number of reproductions from photographs made by Mr. Shapoor N. Bhedwar. Once again he draws his inspiration from the religious mysticism of his native country. A full description of the pictures will be found accompanying them, but we would particularly draw attention to the careful manner in which Mr. Bhedwar has handled the subject—to the composition and posing. It is by far the best thing that Mr. Bhedwar has done that we have seen.

BY J. DE BRUYN KOPS

NAPOLEON SARONY



NAPOLEON SARONY

MANY thousand miles from New York we recently heard by cable of the death of Sarony, and the news came as a great shock to us, for it seems but a few weeks ago that we were chatting pleasantly to this king of photographers, and in our moods he will always be with us still. He was a valued contributor to this magazine. His last article on "The Private Character of Artist's Models" appeared in our "Annual" for '95, and in the current issue of the same work Mr. Gibson Willetts details an interview with him and describes his experiences with Sarah Bernhardt.

Writing in our contemporary, *The Photo American*, Mr. W. A. Cooper gives some interesting reminiscences of the great artist. He says:

"It was but Saturday we enjoyed his presence the entire afternoon, looking over many of his earlier creations—old, wet plates—with a running comment on his many and distinguished sitters. Their idiosyncracies and whims, and his final triumphs in posing them as he chose. I might say that only as late as October 1st I, with two other gentlemen, came into possession of all Mr. Sarony's negatives of celebrities from the first one made in 1866 up to the present, and the knowledge that all the old negatives were to be published and placed in the market interested him greatly; hence his frequent visits to our place. Only one week before his death—election day—he spent all day with me, and began a list from our sample books of the most desirable negatives; that is a very previous list now.

"The elevator was not running and he walked up the seven stories, singing as he always did to himself, as happy and as bright as could be, and in his absent-mindedness, something he was very prone to, he walked up another pair of stairs and landed out on the roof before he found his mistake. That was Tuesday; nearly every afternoon he came, and on Saturday, his last visit, he was particularly reminiscent and full of story and fun. A gentleman called to make an appointment for a sitting with a young violinist just arrived from Europe. Mr. Sarony appointed 11 o'clock, Monday, for the sitting, and enthused over the certainty of the result. I walked with him to the Broadway car, corner of 17th Street at five o'clock, and said good-night. Monday morning we had the news of his death. He must have had a premonition of his going, for his son, Mr. Otto Sarony, his life-long assistant and operator, Mr. Richardson, and Mr. Nice, his artist, in speaking of his last day at the studio, Saturday, said he told them of many of his earlier and boyish exploits, and was unusually bright and chatty, and to me that afternoon he was constantly speaking of his wife and his son with the greatest affection. This side of his nature his close friends knew well, and those who really enjoyed his friendship, had his entire love and affection, and when this was given he would trust implicitly as a child.

"The papers for the past week have been filled with the story of his life and work. The Sunday papers, a week ago, vied with each other in doing him honor. The *World* had several of his first posings in Birmingham of Ida Menkin, just prior to his advent here, and his own portrait, standing with top boot and fur coat, leaning over his own posing chair. These were *cartes-de-visite*, eight on a plate and were printed and sold in this country to photographers as artistic posings. These were charmingly printed on double albumenized paper and in warm, brown tones, the first seen in this country. He also brought out a burnisher, his posing chair, his silk curtain with Grecian border, and many new draperies and backgrounds. He opened at No. 630 Broadway, in 1866. The first sitter was a German tenor singer, and the negative was developed by Mr. Richardson, and every negative since, both wet and dry, has been made by him, and he is still at his post, with Mr. Otto Sarony, No. 256 Fifth Avenue, who, of course, will carry on the business left him by his lamented father.

"Thirty years ago Mr. Sarony, as can be imagined, was the personification of energy and life, and he threw them into his art with all the enthusiasm that youth and genius is capable of. His sitters were the great men and women of the land, and he was one with them. Though small in stature, at times he would seem like a giant, which he was in intellect, and like the gifted Stephen A. Douglass, he seemed larger while sitting, his legs being very short. If Mr. Richardson could be induced to write, how many interesting things he could give, as he has to me, of the amusing battles the Little Corporal had with his army of sitters. Charlotte Cushman was one of his first subjects, and he considered her a good one, and greatly admired her genius, and only lately told me she was the greatest Meg Merrilies on the stage. At her second visit, Mr. Sarony commenced dancing around her in his delight of posing her again. The great woman caught him up in her arms and said in her deepest tone of voice, 'As crazy as ever.' Lester Wallack was inclined to have his own way.

"This with the great Sarony was impossible, and when shown the negatives, as was the case usually in those days, he would storm and blame the little corporal for some fancied mistake in the posing from his point of view. Then would follow a sparring match which would end, as Mr. Richardson says, "with the boss on top." After the fun all would be well and good pictures the result. Bill Tweed was the first stout man photographed. He was leaning over a chair, and could not be got into shape. A blow in the stomach from the little man transformed all this, and Bill was thin. Ristori was a revelation under his hands. He worked her up to such a pitch that the veins on her forehead stood out like whipcords and perspiration started from every pore. Sarony had this faculty of interesting all his sitters, especially actors, in the part they were assuming. That expression and action was everything – that as their acting stirred the hearts and played with the emotions of their audience, so the picture to be great, must have the same soul or life. Then followed Lydia

Thompson, the queen of burlesque, with Harry Becket, the great comedian, and Pauline Markham: the fair Mrs. Scott Siddons, who only last week passed away, was one of his best subjects. Maude Branscombe, under his magic touch, became spiritually beautiful, and Fanny Davenport's negatives, or, as he called her, the divine Fanny, have never been equalled. Then, such actors as Booth, McCullough, Forrest, John Gilbert, James Lewis, Louis James, and John Drew; public men like Tom Nast, his intimate friend; Blaine, Hayes, Garfield, Grant and Horace Greely came under his spell. Mr. Sarony took the latter just as he was with coat collar turned up and necktie under his ear and very characteristic it was. After several poses Mr. Sarony said that is all Mr. Greely, but found the great newspaper man fast asleep He was in perfect harmony with the divine Sarah Bernhardt, and on her first visit, made an appointment for her at 12 o'clock. It came and passed, one, two and three and still no Sarah: at half-past she came with a rush, but with wet plates and a November day it was too late and the little man was annoyed and told her so. She answered, "Vous n'avez pas de cœur." This aroused Sarony to his greatest energy, and poses were made and plates coated and developed with dispatch, and the results were splendid. Sarah departed quite happy and the little man was well pleased. Between 1870 and 1876 Sarony was at his zenith; he occupied the entire building on Union Square excepting the store, with a rental of $8,000 a year. His price for cabinets was $14 a dozen, and he made from thirty to forty sittings a day. This with wet plates developed at once was no child's play. Mr. Sarony was very popular with all classes; his business brought him in contact not only with the actors and actresses, but with great men and women of this country and Europe. But his warmest friends were among the artists. He was the originator of the Tile, and active in the Kit Kat and Salmagundi Clubs, and beloved by the whole fraternity. His absent-mindedness was proverbial. He was a great frequenter of the opera and the play. One night accompanied by his wife he visited Booth's theatre when that great tragedian was at his best. He had seats well down in front, and he sauntered down with his immense fur-lined overcoat, which he took off and threw over the back of the seat. Between the acts he walked about the foyer, chatting with his many friends, and finally returned to his seat, taking off his dress coat and throwing it over his arm as he walked down the aisle in his shirt sleeves. Everyone in the house knew him and was convulsed. During the winter he used to wear an old straw hat in the studio and frequently he would go down Broadway with an immense overcoat and this little straw hat he had forgotten to change. Latterly he has worn a Turkish fez and all of his later pictures are taken with his fez on. They don't do him justice, as he had a splendid head, and his best portrait is a late one without a cap. I will not speak of his later success in charcoal, of which he was a master, nor of his studies from the nude, and his living pictures. We prefer to remember him first and last as our great photographer, who opened up the way and showed the possibilities, and was respected and beloved by small and great, rich and poor.

NAPOLEON SARONY FROM PEN DRAWING BY ISAAC MORGAN, CHICAGO

(*From The American Annual of Photography for* 1897.)

THE CONFESSION OF A CAMERA FIEND.

Some talk of Alexander, and some of the other man in the rabbit skin, but I question whether either of them took so much pride in his sword or his club as I do in my camera. They knocked people down; I take people off; people are none the worse for me, and my collection is all the richer for them. I have raised the snap shot to a fine art. I not only take my friends' portraits, and inspire them with a wholesome terror of me, as common camera men do, but I have several specialties of my own. For instance, I have gathered an entirely original collection of "Celebrities in the Water." Celebrities on land are three a penny; but to have them in the water is unique, and flattering to the soul. What I do is this: In the season I visit the fashionable seaside resorts, go out in a pith helmet and umbrella, and take a chair in front of the bathing machines. I hoist the umbrella, and put the helmet in my lap; inside it, is, of course, my camera, with the lens protruding through the ventilating hole. When my celebrity comes to bathe, I snap him off at both ends. When he plunges in, I take his feet sticking out of the water, and when he emerges I am ready with another plate for his streaming heak, blowing like a grampus. My composition plate of the feet of the present Ministry protruding from the briny makes a wonderful picture of how we are governed. Students of character are apt to make too little of the feet. They are seen to be really very characteristic when inverted and the rest of the body hidden by the wave. The longer a man has been in office, the more his feet curl round in a prehensile or ape-like manner, as though determined to hold on like grim death to whatever he seizes. You can tell also by the snub toes which man is accustomed to kick the rest.

The heads of celebrities when bathing offer a new and pleasing aspect. The moustache, which is the glory of the stage or concert platform is now like a couple of limp tadpoles with their tales hanging down; and the famous whiskers which have been the making of a man in the pulpit, resemble a seedy table-cloth brush, too degenerate to sweep anything into the offertory. The wonted sweet smiles are washed out of the mouths, and the chevelures are moppy. The heads are, in fact, disillusioned, and one turns with relief to the toes. An agreeable companion to the above is my collection of celebrities suffering from mal-de-mer. I take them on my little trips. Last year I had the good fortune to take one of our foremost judges doubled up over a skylight, limp as a week-old codfish, offering a splendid exposure. Presently he rolled over on his back, and I had a fine topside show. These form a pleasing change from his photo as he appears on the bench, and no more acceptable present could be made to the prison population of the country. I have no end of M.P.'s giving up the ghost, and even a bishop rolling in the lee-scuppers. Men make by far the best subjects for this branch of art; they sprawl more, and pull strychnine faces; whereas, ladies are tame game, indeed, they do not exhibit much more depression than they do at a wedding. I remember how disgusted I was the last time the great Sarah came across the Channel. I know she cannot stand the sea, and went down to Dover to register her agonies; but, bless you, she didn't look half so bad as when she says, "I will love thee ever."

I am proud also of my collection of back views. None but myself seems to have given these views the attention they deserve. Now, people generally exercise some control over the front view they present to the gazer; I have a fine series taken in the parks on summer evenings from behind the seats. There is an infinite tenderness in these back views. They exhibit over twenty different ways in which the head of the cook or milliner's apprentice can recline on the shoulder of the attendant swain, or nestle in the nape of his neck; and innumerable true-lovers' knots made by the encircling arms. I have also some choice back views of policemen and chairwomen taken on their leaving areas. The protuberances made by legs of mutton, fowls, and spare linen are great curiosities in anatomy. Then the back is sometimes very deceptive, and I like to show it up, as I do in my double photos, "Look on this picture, and on that." The first is a back view of the Diana or Apollo you often see in the street; all braced in charming lines, jaunty carriage, altogether youthful and fetching. The second, of course, is the same person as seen when you get in front of them, looking like their own grandfathers or grandmothers. The attitude of the public speaker is generally very imposing from the front, but you always get some humor out of his back, whatever you do out of his speech. When he saws the air in denunciation, his coat tails wag like a dog's, and when he weeps in front his shoulder goes right out of joint. In my back views I include those of houses. People's houses are extremely correct in front, with brass door knobs, flowers in pots, and irreproachable curtains; but behind, the frayed muslin comes out, the broken window with the newspaper stuffed in it, and the garments washed at home which are too ragged to be sent to the laundry. You may often, if you are lucky, snap off the master and mistress having words in the back sitting room—a photo which insures you a welcome from any of their friends.

This reminds me of the social aspect of my labors of love, which is a very important one. A good many of my old friends now unaccountably fly when they see me coming, but they would not if they knew what services I can render with my camera. For instance, my friend Robinson has had to part for three weeks with his wife, who has gone into the country to see her mother. He and I arranged that I should take a snap shot at him, quite unknown to him, and send it the lady with my compliments. It was the most touching picture you ever saw of the torments of the temporary bereaved. He lay prone on a garden seat, with his face all drawn up in agony, his necktie undone, one end of his collar unbuttoned, sopping kerchiefs lay around, and by his side was an untouched veal and ham pie, from which he recoiled as loathing food. After taking the shot we went off to dine together at the Thames Hotel, Robinson, of course, standing treat. The photograph was a wonderful success, too much so, unfortunately, for it caused the lady to return home before her time. Then I obliged my old friend, Miss Highflyer. She confided to me that she set her cap at MacBawbee, the great importer of Scotch beef from Canada. MacB. was well alight, and rubbed two sixpences together in his pocket in an emotional manner whenever he saw her; but it was discovered he had doubts of her domesteecity." So I took a snap shot of her as she appeared in a housemaid's gown, peeling potatoes, and giving her eyes to a porridge pot. That photo fetched him, and she now rubs his sixpences for him. My art has also enabled me to put a little pressure on that syren, Miss Green. She does not seem to favor my advances; in fact, I overheard her say to a friend, as I approached her smiling the other day, "Here cames that little cad again." But now, at any moment, I can have my revenge. I have a negative at home which will make her sit up and be civil. She has lately taken to cycling, riding but very slowly, and a happy thought struck me while smarting under her rebuffs. Concealed by a tree in the park I took her on her cycle. During the time of the exposure she had moved about a yard; consequently the photo, which is a good likeness in the face, represents her as about four feet thick on the average. If she continues to snub me, round it goes to our mutual friends, who will be delighted to have it in their albums.—*Allahabad Post.*

HOCHSTADTER'S FORMULA FOR PLATINUM DEVELOPER.

COLD PROCESS.

Oxalate of Potash Neut	14½ ounces
Bi-Phosphate of Potash	1½ ounces

Dissolve in 100 ounces of water. Distilled is best.

INTENSIFYING, REDUCING AND TONING SLIDES.

BY E. J. WALL.

THIS world would be a totally different thing were there no failures, and the next best thing to making failures is to know how to rectify them

Errors in exposure, at least ever-exposure and under-development, can be rectified by intensification, whereas over-development may be remedied by reduction.

Intensification may lead to a totally different change of color, and for this very reason sometimes expert lantern-slide makers resort to this always to obtain a particular tone. A lantern slide does not differ from a negative as to the treatment required in intensification and reduction; but in order to make this series of articles complete, and avoid the necessity of reference to books, the formulæ for the principal intensifiers and reducers will be given.

The slide must be well washed to free it from hypo, then bleached in

Mercuric chloride	100 grs.
Ammonium chloride	100 "
Water to	10 ozs.

Then well washed and blackened in one of the following solutions:—

Sodium sulphite	5 per cent. solution.

This gives black images with a slightly warm-brown tinge.

Ammonia	5 per cent. solution.

This gives black images.

Silver nitrate	100 grs.
Distilled Water	5 ozs.

Dissolve and add gradually

Potassium cyanide	100 grs.
Distilled water	2 ozs.

The mixture must be well shaken after each addition, and a little precipitate allowed to remain undissolved. This gives warm brown-black tones.

If the bleached image is re-developed with ferrous oxalate hydroquinone, or metol developers, pure black tones are obtained.

For very warm reddish-brown tone it is advisable to develop with any but an iron developer, and not to develop too far, to fix and well wash, and treat the plate with the uranium intensifier.

Uranium nitrate	100 grs.
Potassium ferridcyanide	100 "
Glacial acetic acid	½ oz.
Water to	10 ozs.

when according to the length of immersion, the image will be brownish black, warm brown, or even reddish brown. Slides after this intensification should not be washed much, and preferably in acidulated water.

According to a recent writer in a German contemporary, whose formulæ we have not yet tried, other tones may be obtained by treatment as follows:

Orange Tones.

A.	Potassium ferrocyanide	1½ grs.
	Water	1 oz.
B.	Uranium nitrate	5 grs.
	Ammonium sulphocyanide	25 "
	Glacial acetic acid	5 "
	Water	1 oz.

Mix in equal parts before use and flow over the slide. If the whites are tinged, then this may be removed by using a solution of

Carbonate of soda	1 gr.
Water	1 oz.

For blue tones this author suggests

Ferric oxalate	1½ grs.
Potassium ferridcyanide	1 gr.
Water	2 ozs.

This solution must be freshly prepared or else kept in the dark.

Green tones can be obtained by treating the slide after the above bath with a weak aqueous solution of potassium chromate and drying in the air.

Red tones may be obtained with

Potassium oxalate (saturated solution)	2 ozs.
Cupric oxalate	4½ grs.
Potassium ferridcyanide	1 gr.

Very warm sepia tones may be obtained with a very dilute solution of ammonium molybdate in oxalic acid, to which 3 to 4 per cent. of potassium ferridcyanide has been added.

It frequently happens that a slide, whilst otherwise perfect, shows a faint fog and flatness; in this case it may be first rinsed with a 5 per cent. solution of ferric chloride and refixed, or else flowed once or twice with a reducer, then well washed and intensified if required.

Farmer's reducer, which, as everybody knows, is merely the addition of a few drops of a 10 per cent. solution of potassium ferridcyanide to some clean hypo solution, the action depending upon the amount of ferridcyanide present, may be flowed once or twice over the slide to just reduce it, while a longer immersion will reduce it still more.

Belitzski's reducer is my favorite, only because it can be kept in stock solution.

Potassium ferric oxalate	200 grs.
Sodium sulphite	200 "
Water	5 ozs.

Dissolve the iron salt, add the sulphite, and add

Oxalic acid (crystal)	75 grs.

till the solution turns green; decant from any undissolved acid and add

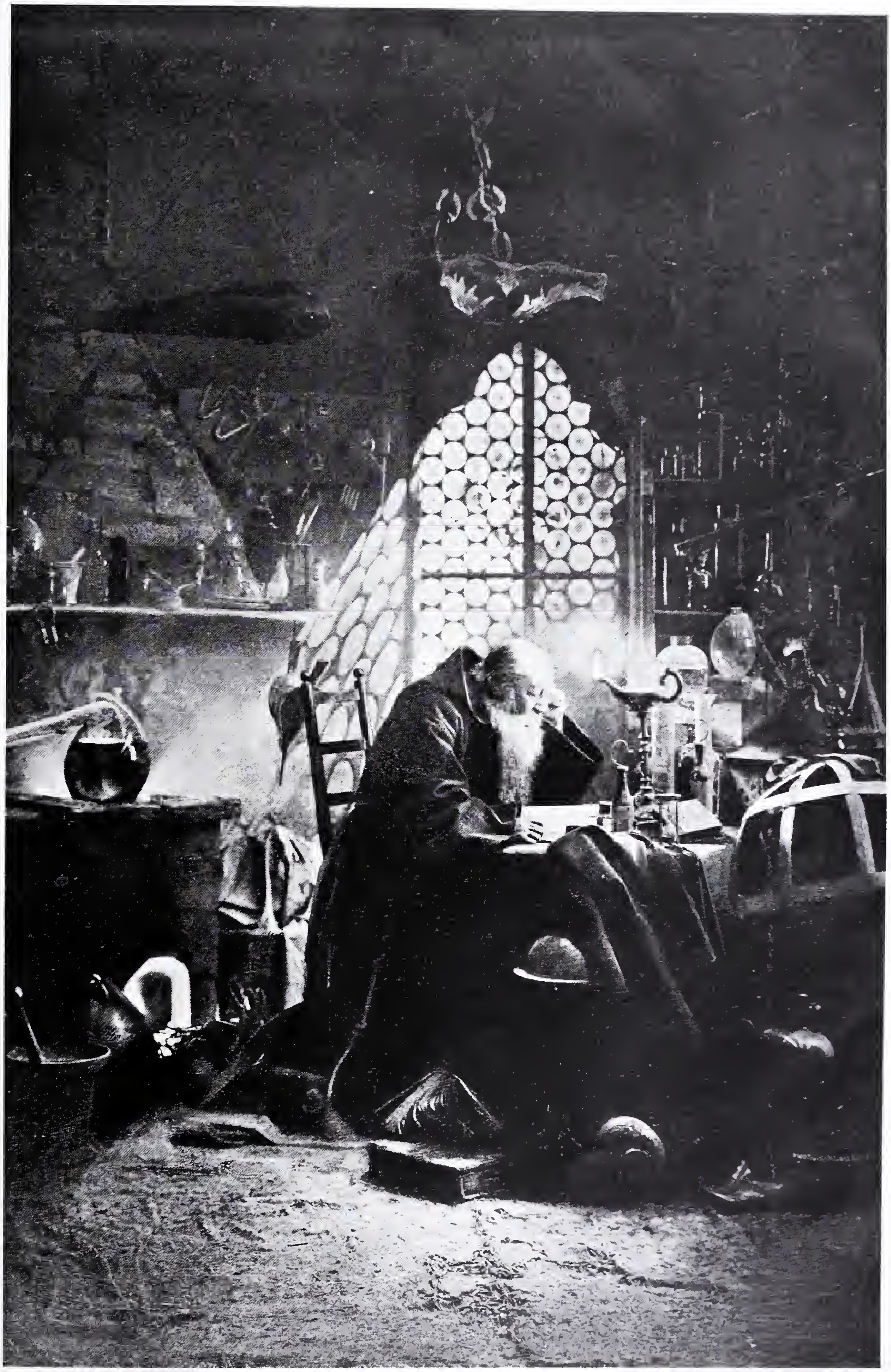
Hypo	2½ ozs.

and sufficient

Water to make	10 ozs.

Frequently flowing a slide with a solution of citric or sulphuric acid and alum is sufficient to clear up the high lights and give the last touch of brilliancy.

In all cases, however, I advise the application of an acid clearing bath, and gentle friction with a tuft of cotton wool to clear off any possible deposit of lime or earthy salts from the water.—*The Photographic News.*



THE ALCHEMIST

BY FRED. BOISSONAS

NOTES.

The Prince of Wales recently had his hand radiographed.

The Y. M. C. A. of Evansville, Ind., is organizing a camera club.

The London Camera Clnb recently held a most successful exhibition.

A Photographic Union has been successfully inaugurated in New South Wales.

The Anarithmoscope is the name of the latest device for producing animated photographs upon the screen.

The London Salon was a grand success. The sale of pictures was considerably in excess of last year.

Hand Camera Lenses often get dusty without the photographer knowing it. Give them a good overhauling occasionally.

"Your 'Annual' for 1897 is just to hand. It is a beauty," writes Mr. B. J. Falk, the well-known photographer.

The First Edition of 12,000 copies of "The American Annual of Photography" for 1897 is almost entirely exhausted. Have you received your copy? Many hundreds were disappointed last year.

Hamburg Exhibition.—At the exhibition recently held by the Hamburg Photographic Society, the following Americans exhibited: A. L. Eidemiller, Chas. E. Fairman, W. B. Post, Alfred Stieglitz and James Wilson.

The First Annual Convention of the Photographers' Association of Pennsylvania, will be held at Harrisburg, January 26th, 27th and 28th. Full particulars can be obtained from E. E. Seavy, Secretary, New Castle, Pa.

McClure's Magazine for November contains an article by Mrs. D. T. Davis on the introduction and development of the daguerreotype in America. The article is illustrated with original daguerreotype portraits of Webster, Greeley and many other notabilities.

A Treat for Artists.—The Autumn scenery of the Hudson River and Mohawk Valley lends additional charm to a trip over the New York Central at this season. Fourteen fast trains every day between New York and Buffalo and Niagara Falls.

A New Focus Tube.—The chief inprovement made by the followers of Roentgen, says *Invention*, have been in the line of concentrating the X rays so as to give sharper shadows. A French physicist, M. Gouy, now proposes a new kind of focus tube in which the cathode is in the form of a portion of a cylinder, which focuses its rays upon a very narrow platinum strip, from which they pass as a line that becomes scarcely more than a point at the place where it is made to strike endwise against the glass wall of the tube. Glass, it is well known, is very opaque to the Roentgen rays. Professor A. Roiti has therefore devised a Crookes tube in which an aperture in the glass is closed by a cap of aluminum, which serves as the anode, and through which the rays pass more readily than through the side of the ordinary glass tube. Photographs of bones, etc., show that the new tube gives decidedly increased sharpness of definition. In pictures taken to show the interior of bones, some details of structure are lost through over-exposure, and a plan for getting views of all parts is to expose a pile of half-a-dozen or more sensitive plates together. If the top plate is suitably exposed for the least transparent tissues, the plates lower down will have the exposure necessary to show other portions.

A Very Simple Method of Trimming and Mounting Prints.—Many amateurs manage their work admirably well until they come to the mounting of their prints, and as they approach this stage it is with great fear and trembling, for which there is absolutely no necessity. In this respect I have had no fear since I was recommended by an old hand to adopt the following method: I first trim my prints by laying them upon a piece of plate glass, which I keep for the purpose, then I place my cutting shape into position. It is now important that the condition of the knife should be looked at. I have a piece of emery cloth, F F and F, glued upon each side of a piece of wood. To give the knife a rub or two upon this gives it a splendid edge in a moment or so. Should the edge be a little rough you can smooth it by rubbing it on a piece of plain wood.

Everything being now ready I trim my prints, then tone, fix, and then place them into the alum bath (which never should be omitted), as it hardens the surface of the prints. After the usual washing I clean an old half-plate negative. I then lay it upon a towel or a piece of old twist sheet to absorb the surplus water. I now take the prints from the water with the left hand; having a sponge in the right hand I wash the plate of each print, then laying them one upon another face down, this being repeated until all the prints are in position.

Then I take a piece of blotting paper and lay upon the top of them, and with the hand or squeegee press all the surplus moisture out of them. This being done, the prints are now ready for mounting.

I place my mounts on the table to my left, the mounter and brush to my right. I now apply the mounter to the print, being careful to cover the edges. Then I gently raise it with the edge of my pocket knife, lay it in position upon the mount, then place upon it a piece of thin india-rubber or a piece of vegetable parchment such as provision dealers use to wrap their butter in, then with the hand or squeegee press the print into position.

Now raise the parchment carefully from the print and set it to dry.

Any mark upon the surface will disappear when the print is dry.

So finishes this simple method.

I use the Higgins Photo Mounter, as I find it the best in the market.—A. G. J. in *The Photographic News*.

Mounting Gelatino-Chloride Prints.—In mounting prints on P. O. P. or any similar gelatine paper with starch or other water mountant, great care must be taken that none of the moisture gets on to the face of the print, for in that case the gelatine would become so softened that portions of it would be almost certain to leave the paper when the print is being pressed on to the mount. The best and safest way of applying starch paste for mounting purposes is as follows: Take an old newspaper, or better still, a back number of any periodical in book form (except, of course, the *A. P.*), and opening it at the first page, lay a print face downwards upon it, and place a small quantity of newly-made and still warm starch in the centre. Spread the starch with the fingers all over the back of the print, except at the extreme edges. Then with the fingers of one hand hold the print firmly, so that it cannot slip, and with the other spread the mountant over the edges, and keep on rubbing it into all portions of the print until it lies flat upon the paper. If no more than the right amount of starch has been used, there will by this time be only enough to form a thin film upon the back of the print. Now treat another print in the same way, and a third, and even a fourth, by which time the first will be quite limp. Then very gingerly spread a small extra quantity of starch upon it—only just enough to make the fingers slide over it, holding it firmly down with the other hand meanwhile, and then lift it by the corners and place it in position upon its mount to which it should be vigorously beaten—not rubbed down—with a soft handkerchief. A good plan is to lay it on a table and thump it with the soft part of the fist to ensure perfect adhesion between print and mount. Now subject a fifth print to operation No. 1, upon a fresh piece of paper, and the mounting of the second may then be proceeded with, and so on to the end. Should a small quanty of starch by any chance creep round to the face of the print, it should be immediately removed by very gentle rubbing with a soft, wet cloth.—*The* (London) *Amateur Photographer*.

Blue Tones on Lantern Slides.—The lantern plate developed in the ordinary manner and well washed is immersed in the following solution:

10 per cent. uranium nitrate solution,	10 cc.
Distilled Water	100 cc.

10 per cent. potassium ferricyanide solution	10 cc.
Distilled Water	100 cc.
Glacial acetic acid	10 drops

After adding the acetic acid the two solutions are mixed. In this toning solution the transparency assumes in succession a brown sepia and red tint, after which it is washed in running water for two or three minutes and then dipped in a 25 per cent. solution of sulphate of iron, which changes it to a blue or green tone, according to the depth to which the first toning has been carried. The redder the preliminary toning the bluer will be the resulting color.—M. GAUMONT in *Bull. Soc. Fr. Phot.*, translated by R. C. B. in *The Photographic Journal*.

The Photographers' Association of Michigan will hold a convention at Detroit, February 2 and 3 next. Applications for space and full particulars can be obtained from Mr. Charles E. Heath, 145 Monroe Street, Grand Rapids, Michigan.

Removable Backing for Dry Plates.—The most common complaint, in reference to backing plates to prevent halation, seems to be the "messiness" of applying the mixture to the glass. Personally, we find none of this annoyance; and we believe that others who have ever actually undertaken to back a plate realize that there is really very little mess or trouble about the operation. The universal demand is for a sort of removable backing that can be attached to a plate in an instant and stripped off as quickly; but these, as a rule, are rarely effective.

The following plan, recommended by Dementjeff, looks more promising than any other we have yet heard of:

A sheet of glass is cleaned and talced, and the talc is removed from the edges to the width of about a quarter of an inch. The plate is then coated with enamel collodion and allowed to dry; it is then placed on a leveling stand and coated with a 10 per cent. gelatine solution to which a little glycerine has been added.

When this substratum is dry, the plate is coated with colored gelatine, prepared as follows:

Twelve parts of gelatine are allowed to swell in 90 parts of water, melted in a water bath, and then 8 parts of sugar and 80 parts of glycerine are added. The mixture is then colored with aurine, chrysoidine, and methyl violet; the following proportions being used:

Gelatine solution (as above)	60 parts
Saturated alcoholic solution of chrysoidine	2 parts
" " " " aurine	2 parts
" " " " methyl violet	½ part

The film will be in proper condition for use in about two days, when it may be stripped from the glass and cut into suitable sizes. It is used as a backing, by merely squeegeeing into contact with the back of the plate with a roller squeegee. It can be easily stripped after use, leaves no stain, and may be used again and again.—*The Amateur Photographer*.

Blind to the X Rays.—In the *Public Ledger* we read of some important experiments recently made with the X rays. Mr. E. E. Allen, Superintendent of the School for the Blind, Twentieth and Race Streets, with two blind students, visited the X ray laboratory of John Carbutt, at his dry plate factory, Wayne Junction, for the purpose of testing the efficiency of the X rays as to their enabling the blind to see either light or objects. Both boys were intelligent pupils of the school. One had become blind soon after birth, but could see light and distinguish objects; the other had been blest with his eyesight up to his 13th year, but for several years had been nearly totally blind. The first experiment, the room being darkened, was to cause an intense spark to cross the terminals of a powerful induction coil. Each pupil in turn stood before the coil, being instructed to direct their eyes across the spark, but neither could detect any visual effect, and only the noise of the snapping of the spark was heard by them; then a Crookes tube was excited by the induction coil, giving off an abundance of X rays. First each pupil was seated before the tube and the X rays directed toward their eyes, but without any sensation of light. Then a fluorescent screen, without its frame, was held in front of the tube, giving a bright fluorescence, and still no light sensation was made on the optic nerves, and no effect when held to side and back of the head. Then a fluoroscope was held before the eyes of one who in his earlier years had his eyesight. At first he thought he could discover the difference between when the field of the fluoroscope was clear and when partly darkened by the hand or an opaque object held before it. On placing his own hand in front of the fluoroscope and asked to open and close the fingers, he exclaimed somewhat excitedly, "yes, I see," but on a further test by placing another person's hand on the fluoroscope, he could *not* detect any form, and afterward said the seeing the shadow of his own hand must have been imagination, knowing it to be his own hand and conscious of moving his own fingers. As to the other pupil, who was born blind, but yet can discern the direction of a window by the light coming through it, the X rays made not the slighest impression on his eyes. These experiments while they may not be conclusive, go to show that there is little to hope in any benefit to the blind being derived from the use of the X rays.

The boys had explained to them the value of the X rays in locating foreign substances in various parts of the human body, and were allowed to handle the mummied hand and foot from the body of an Egyptian princess, which seemed to interest them even more than the X rays, because by their acute sense of touch they really perceived the object. Mr. Carbutt very kindly offered to continue the experiments, and in the near future Mr. Allen may take out to Wayne Junction other pupils who have different degrees of blindness.

The pupils (Lee Parts, aged 16, and Charles Ruddy, aged 21), were not at all disappointed over the result of their visit, as Superintendent Allen had forewarned them that there was practically no hope of benefit to them from the discovery. In fact, Mr. White recently assembled the whole school and warned the members not to permit their hopes to be raised by what they would be apt to hear about the X rays making the blind see.

The Royal Photographic Society's Exhibition was also a most successful one. Many of the pictures will go to Calcutta for the Exhibition of the Photographic Society of India.

Indian Photographic Exhibition.—The annual International Exhibition held in connection with the Photographie Society of India will be opened in Calcutta on the 15th of January next.

Could See Gold.—Physician of the new school after turning X rays on patient: "Your case is a somewhat complicated one. There is a slight trouble with your left lung, and I observe enlargement of the liver and fatty degeneration of the heart. Kindly hand me those two sovereigns in your right hand trousers pocket and I will prescribe for you."

"**The principal object** in a landscape is the foreground, and curiously enough there is nothing in which photographers more generally err by giving it too much space and too little attention. The foreground of a picture should be like the entrance hall of a well equipped and tastefully finished mansion, never large enough to dwarf the more important rooms to which it leads, but so furnished as to give an idea or foretaste of what is beyond."—JOHN CLARKE.

Ferric Sulphate as Restrainer.—Le Roy, in the *Bulletin de la Société Française*, suggests the use of ferric sulphate as a restrainer in the ferrous-oxalate developer, and states that it is better than using an old developer, as its action is more certain. About ten or twenty drops of a 10 per cent. solution should be added to each ounce of the developer.

Varnishing Films.—Balagny recommends giving cut films a coating of 3 per cent. amyl-acetate collodion, to which about 2 per cent. of castor oil has been added. The film should be fastened by pins to a board, and brushed over with the above varnish, a narrow margin being left untouched. When the varnish is dry, the film should be turned over and treated in exactly the same way. He states that films treated in this way will not curl.

Fog on Celluloid Films.—Hans Klep think that the markings or fog sometimes observed on sensitized celluloid films is due to the action of camphor vapor on the silver salt, this vapor being set free by electrification at various points, or by the action of the salts left in the film.

To Clean Lenses.—Lenses may be cleaned by rubbing them with them cotton wool moistened with a mixture of distilled water, 2 ounces; alcohol, 1 ounce; nitric acid, 3 drops, and then polishing with wash leather.

To Clean Glass.—When extra clean glass is wanted for photographic purposes, the following will be found the very best glass-cleaning mixture it is possible to make, according to the *Photographic News*:

Powdered pumice stone	1 ounce
Powdered chalk or whiting	1½ ounces
Ammonia	½ ounce
Soft water	1 "

Apply with a piece of wash leather, and polish with a piece of rag or soft paper. Dirt will vanish as if by magic.

Backing for Process Dry Plates.—Now that process dry plates are coming into use, it would be wise to have a piece of cardboard the size of the dry plate used, and covered on one side with black velvet, to back the plate up with and prevent halation. Sometimes the brass spring on the plate-holder door becomes so polished where it presses against the glass that it reflects two bright spots of light that, if noticed, are usually attributed to "dirt in the glass." The black velvet, or other light-absorbing backing, prevents all such trouble.

Intensification.—Paul V. Janko has been determining the various degrees of intensity given by the best known intensifiers, and has drawn up the following table :

Bleached in	Blackened by	Ratio of Intensity
Cupric Bromide	Metol	15 : 14
"	Hydroquinone	15 : 13
"	Pyrogallol	15 : 12
"	Silver Nitrate	15 : 8
—	Mercuric iodide (Edwards)	15 : 10
Mercuric Chloride	Sodium sulphite	15 : 14
"	Ferrous oxalite	15 : 13
"	Hydroquinone	15 : 12
"	Hyposulphite, or with ammonia	15 : 11
"	Ammonia	15 : 10
"	Ammonia, the plate being dried before blackening	15 : 8.5
"	Ammonium sulphide	15 : 7
—	Uranium	15 : 6

The uranium intensifier gives the greatest increase, next ammonium sulphide, a result which agrees with practice.

Magic Pictures, which only become visible by gradual development on the lantern screen, are made as follows: Upon a glass of the desired size, perfectly clean, we pour a solution of india-rubber in benzine, working as we should do with collodion, of a strength analogous to that of collodion. This must be allowed to dry, after which it is placed upon the design that we desire to reproduce. (There is nothing to prevent this from being a photograph.) Then with a very fine brush, dipped in a solution of bromide of copper, we trace the design. If the lines made are very heavy, the image will be visible, and the effect will be wanting ; it must therefore be done very delicately. After having outlined the image, we carefully paint the trees, foliage, grass, in a word, all the verdure, with bromide of cobalt; the sky and water must be done with a solution of acetate of cobalt, with the aid of a very soft and fine brush. We mount this as we should do an ordinary lantern slide. If the work is well done, the image ought to be entirely invisible, but, when placed in the lantern, it will gradually appear to perfection under the influence of heat. By these means may be depicted winter scenes, which under the action of the heat of the fire are transformed into scenes of summer; these return to their primitive appearance on cooling. With a little care and ordinary skill it is possible to obtain this pleasing and novel transformation with photographs.—*Post Express, Rochester, N. Y.*

A Good Method of Local Intensification.—A method of local intensification which gives opportunities for artistic treatment is as follows :—First remove all hypo from the film by thorough washing and immersion for twenty minutes in a solution of chrome alum and citric acid, each one ounce in a pint of water. Then intensify the whole negative with the usual uranium intensifier made as follows :—1. Uranium nitrate, 15 grains; water, 4 ounces. 2. Ferricyanide of potassium, 15 grains; water, 4 ounces. Mix 1 and 2 in equal parts, and to every 100 parts of the mixture add 10 parts of glacial acetic acid. As soon as the required degree of intensification of the given parts has been reached, wash the negative well and remove all water from the surface with blotting paper, so that the film is only moist. Brush over the too vigorous places with diluted ammonia (1 part ammonia of specific gravity 0.96 in 20 parts of water) with a soft hair pencil. The intensification quite fades away in these places. After treatment with ammonia the negative is again well washed.—*G. E. B in The Photographic News.*

Photo-Recording Devices.—"There appears to be room," says the *Optician*, "for a good many applications of the principle of photographic recording in connection with teleautograph receivers. Some of these instruments, constructed on purely mechanical principles, involve so much friction that it is practically impossible that they should be made to work satisfactorily. The 'syphon' recording pen is used in some of the best instruments of this class; but the trace of a fine pencil of light could be made to respond even more perfectly to differential magnetic impulses."

Sunlight at Sea.—Even where the depth of the sea is 1,580 feet, sunlight will penetrate if the water is very clear. Experiments which were made in the Mediterranean, near Corsica, 18 miles from the land, prove this to be the case, and the results were shown by means of photographic plates. The depths to which daylight will penetrate depends, of course, upon the transparency of the water. The Mediterranean is famous for the clearness of its depths, and will admit light to a very great depth. Usually the light of the sun at 150 ft. below the water surface is no more powerful than that of the moon, but at 300 ft. it is scarcely equal to the glimmer of twilight, and at 600 ft. there is generally perpetual darkness. The spotted corals are plainly visible near Mindora in the Indian Ocean at 150 ft under water. The Caribbean Sea, which is of crystal clearness, shows objects at the bottom at a very great depth.—*Invention.*

Hardening Gelatine Prints Without Alum,—The following bath is said to be excellent for making the surface of gelatine prints extremely hard:

Tannin	1 gr.
Sodium chloride	10 gr.
Saturated solution of potassium aluminium sulphate	100 min.
Distilled water	2 oz.

After fifteen minutes' immersion the prints can be pressed between blotting paper without sticking. If dried on glass plates previously rubbed with talc, they may be dried at a temperature of 85 deg. F., and will leave the glass in about half an hour with an indestructible gloss. If the prints should be touched with wet or greasy fingers it is only necessary to rub them with a dry rag to remove every trace of the marks. The whites remain quite pure, and prints treated in this way can be retouched without leaving perceptible traces of the work.—*The Amateur* (*London*) *Photographer.*

Copying Line Drawings.—It occasionally happens that an amateur finds it necessary to make a negative from a newspaper illustration of the common type—

black lines on a white ground—say for lantern slide purposes. It is an operation which is by no means as simple as it might appear. Newspaper illustrations of the "pen and ink" variety—such as those by Phil May and Reginald Cleaver, to take two diverse examples—are often printed on thin and to a certain extent transparent paper, so that in the white spaces the drawings on the opposite side occasionally show through. Pin the sheet of paper to be copied to a board faced with black velvet, and this difficulty will disappear, for everything being in black it will make no difference whether it has black lines upon its back or not. See that both glasses of the lens are carefully cleaned; that the print is brightly and equally lighted, but in such a manner that there can be no reflection from the shiny surface of the printing ink, into the lens—bearing in mind that the angle of reflection is equal to the angle of incidence. Use as large a stop as is compatible with good definition, use photo-mechanical plates, develop with hydroquinone, and be very careful not to over-expose. Remember, the quality to be arrived at is absolutely clear glass lines on a dense black ground. Continue development only so long as the lines remain absolutely white as the plate lies in the dish, then immediately stop it, and further density must be obtained by after intensification.—*The (London) Amateur Photographer.*

Silver Prints can be transformed into blue or red by the following methods: The print, after careful washing, is placed in a bath of

Ferric oxalate	1 gramme
Red prussiate of potassium	1 gramme
Water	2000 c.c.

Which tones the print to a blue.

To tone this blue to violet it is placed in a bath composed of

Water	100 grammes
Chloride or sulphate of copper	1 gramme

To which is added enough carbonate of ammonia to dissolve the first precipitate of carbonate of copper which is thrown down, making a deep-blue solution. The longer the print remains in this the redder it will become. In order to change it into an entirely red print, it is placed in a bath made by adding a saturated solution of ammonia to a 1 to 2 per cent. solution of copper chloride or sulphate, until the precipitate thrown down is redissolved, and then adding to each 100 c.c. of this solution one-half gramme of red prussiate of potassium. The red tone of the print is entirely different from that obtained with uranium. The best results are obtained with bromide and salted papers.—*Photo. Gazette.*

A Simultaneous Printing and Toning Process.—This is the invention of Messrs. Paul Emil Schoenfelder and Emil Kehle, who state that its object is to provide a chemical compound or composition for the preparation of paper, especially glazed paper, porcelain, or any other suitable material, on which photographic prints are to be made from a negative plate, whereby the toning of the picture is accomplished simultaneously with the printing, and thus the subject of the print, after it is made, to a separate toning bath, is fully avoided.

The composition consists of the following ingredients, combined in the proportion stated, and which we will call stock or ground solution:

STOCK SOLUTION A.

Collodion.

Pyroxyline	300 grains
Ether	1 pound
Alcohol (absolute)	1 "

STOCK SOLUTION B.

Fifteen grains of chloride of a metal of the platina class, such as chloride of gold, or iridium, of rhodium, of osmium, of palladium, or of platinum.

Said fifteen grains of chloride being dissolved in half an ounce of alcohol (forty per cent.)

From the Stock Solution A one and a half ounces is thoroughly mixed with ten drops of Stock Solution B, and the following ingredients are added in the proportions stated, viz.:

(*a*). Three grains of an organic acid, such as citric acid (tartaric acid, formic acid, etc.), which is dissolved before mixing with the other ingredients in three drops of alcohol.

(*b*). Fifteen grains of nitrate of silver, or its equivalent, first dissolved in fifty drops of forty per cent. alcohol.

(*c*). One and a half grains of a chloride—such as chloride of strontium, or of barium, or of zirconia—dissolved, before mixing with the other ingredients, in three drops of forty per cent. alcohol; and—

(*d*). Two drops of a softening chemical, such as glycerine or castor oil.

The above emulsion is applied to the surface of the material on which the picture or photograph is to be printed. The surface must be thoroughly dried before using.

After the print has been made, it is given a bath in a solution of hyposulphite of soda. one part to fifteen parts of water, in which bath it remains until all superfluous chemicals have been removed from the picture (about five minutes), when it is taken out and thoroughly washed in clean water.

The picture is then ready for mounting, and does not require any additional toning, as the toning has been accomplished simultaneously with the printing, and it has a superior finish, that will not fade or turn yellow by being exposed to light.

In place of stock solution A, a solution can be used composed of gelatine one part and water three parts, in which case the ingredients mentioned under *a*, *b* and *c* are dissolved in water instead of alcohol.

The claims are:

1. A chemical composition to be used for preparing the surface of suitable material for photographic purposes consisting of a chloride of metal of the platinum class, of nitrate of silver or its equivalent, a holding substance, and an organic acid, such as citric acid.

2 A chemical composition to be used for preparing the surface of suitable material for photographic prints, consisting of a salt of a metal of the platinum class, of nitrate of silver or its equivalent, a holding substance, such as collodion, an organic acid, such as citric acid, and glycerine or its equivalent.

3. A chemical composition to be used for preparing the surface of suitable material for photographic prints consisting of a holding substance, such as collodion, a salt of a metal of the platinum class, of nitrate of silver or its equivalent, a chloride, such as chloride of strontium, a softening ingredient, such as glycerine, an organic acid, such as citric acid.

ON THE COLOR OF NEGATIVES AS INFLUENCING THE PRINTS FROM THEM.

BY W. K. BURTON.

THOSE who remember the introduction of the present dry-plate process—or rather the time when it began to oust the wet plate—will also remember the marvelous colors of many of the negatives that were produced, and also the astonishment of old hands—not yet converted—that some of these negatives, certainly miserable looking objects, as compared with a collodion negative, would produce really good prints. Often we have heard the exclamation, "You don't mean to say you expect to get a decent print from *that!*"

It is all a case of color of negative. This is a subject that used to be much discussed, but that is little thought of now, modern developers nearly all giving a close approach to black in the image. A communication to a contemporary called our attention to the subject some time ago, and caused us to hark back to the presulphite days, and to develop some plates with several of the old developers that gave a distinct brown or yellow image.

In considering this subject, it is necessary to make a clear distinction. If a negative is colored, there may be one of several things. The *image* only may be colored, the shadows, if these be without deposit, being clear and colorless; the *film* may be colored, in which case the clearest shadows will show the tint as well as the image, or the *shadows* alone may be colored, as in the cases of green and red fog, pests of fifteen years ago that are scarcely known now. Of green and red fog we have nothing to say here. In the early days of gelatine dry plates, using the pyro developer; about the best, that was looked for was a colored image *plus* a colored film. The color of the deposit by transmitted light was a greenish brown, and that of the film a yellow, or in some cases even a brown.

These old negatives gave magnificant prints, but oh! what a time the printing took! and there was no bromide paper in those days.

Then there came the introduction, by one who signed himself "J, C.," of the acid alum bath—saturated solution of common alum 19 parts, hydrochloric acid 1 part. By the use of this the color could be removed from the film, but not from the actnal image, though that was made to appear more nearly black, on account of the removal of the yellow color from the film in which the deposit of silver was embedded. It was noticeable that distinctly softer prints resulted after treatment with the acid alum bath than before, from which fact some argued that the opacity of the actual image was reduced. Probably it was not, but the action was the converse of that in which we print through light yellow glass, if a negative is *just a shade* too thin. We do not know that any explanation has ever been given of the undoubted fact that a slightly stronger print is got if the light be yellow than if it be white. The effect is not due merely to the longer time taken in printing. The use of a yellow film for printing through, when negatives are just a trifle thin, has been known for a long time. In the old books on the wet process, we find it recommended, in the case of which negatives. to varnish with a yellow varnish.

To return, however, to negatives of the presulphite days. It may be of interest, as a matter of history to note that sulphite of soda was recommended by the late Mr. Herbert Berkley long before the acid alum bath, but that the suggestion fell flat, and remained so for years. Perhaps this was due to the very imperfect supply of even fairly good sulphite at a moderate price. We remember finding the first sample of sulphite a complete failure, and concluding that there simply was no effect at all brought about by the use of the substance. It was only when Mr. Berkley showed the result of the use sulphite at the (now Royal) Photographic Society of Great Britain that the use of it became general.

The negatives with colored image and colored film gave, as we have stated, splendid prints, but they were "too awful" in the matter of time of printing. They became things of the past as soon as a way was found of removing the color from the film.

How about a negative with a colored image and a clean film, however? One that will be got by the use of nearly any of the old developers, such as, for example:

A.

Pyro	1 ounce
Citric acid	½ ounce
Water up to	10 ounces

B.

A ten per cent solution of crystalline carbonate of soda.

For use 1 ounce of B and 40 minims of A to be taken, the whole to be made up to 2 ounces with watar.

Negatives to be treated with the acid alum bath.

Those who are accustomed only to the most modern developers, always give black images, will at once note one thing on using such a developer, as this, namely, that if development be carried so far as to give a density that appears to them to be right, the prints, by nearly any process, will be very hard. Indeed, when the image is of a distinctively greenish brown color, the negative that will give a good print is a very poor thin-looking object. The question is, does such a negative give a better print than is got from a negative with a black image of a corresponding density.

We have made some experiments to try to decide this question lately. We produce some negatives, using the developing formula given above, and looked out some negatives made about eight years ago, at a time when we could not get a supply of sulphite, and printed on the same kind of paper from thin and from negatives with black images. It is very difficult to be sure of the result of comparison in such cases, because it is difficult to be at all sure that negatives with different colors of image have "corresponding densities." It appeared to us, however, that at least in the case of silver printing processes—those tried were albumenized paper, plain paper, gelatino-chloride and collodio-chloride—an advantage was derived from the color of the image. Toning seemed to be easier, and the resulting color seemed to be more pleasing in prints from negatives with a colored image than with a black.

At any rate, this is a subject worth more consideration than it receives at the present time.

We conclude with the time-worn advice to remember that the negative is only a means to an end, not in itself an end.—*Photography.*

TRADE NOTES.

M. J. Delvaille has purchased the entire stock and good will of The Photo. Co., of 829 Canal Street, New Orleans, La.

The Taber Bas Relief Photograph Co. have instituted an action against Theodore C. Marceau for infringement of their patent for making embossed photographs.

The firm of Loar & Co., of Grafton, West Virginia, has been dissolved by the mutual consent of the partners. Hereafter the business will be conducted by W. R. Loar.

We are pleased to learn that the artistic abilities of Messrs. Gilbert & Bacon, of Philadelphia, are recognized in other than this country, for their pictures received the highest award at the recent convention of German photographers, held at Triu, Germany, August 25th to 29th. We congratulate Gilbert & Bacon.

We learn that the exhibits of the Actien Gesellschaft fur Anilin Fabrikation, of Berlin, Germany, have obtained the gold medal offered at the Berlin Industrial Exhibition for 1896 and the International Exhibition for Amateur Photography, held in the Reichstags building (Parliament House), Berlin. This fact speaks well for the quality of the products made by this company.

Travel Up to Date.—The New York Central offers unequalled advantages for through travel between the east and west. It is the only Trunk Line entering the city of New York; its Grand Central Station is in the very centre of the metropolis, in the midst of the hotel, residence and theatre district; it is the only line protected its entire length by Block Signals; it has the fastest trains in the world; the finest equipment; scenery including the Hudson River, Mohawk Valley and Niagara Falls.

Photographic Amusements.—Under the title of "Photographic Amusements," The Scovill and Adams Company, of New York, have issued a book crammed full of descriptions and illustrations of curious and novel photographic diversions. The contents have been compiled from various sources, under the editorship of Mr. Walter E. Woodbury, who claims no part of the book as his own work, save the collecting and embodying the articles in book form. Among the many subjects dealt with we notice magic photographs, spirit photography, photographs on silk and various fabrics, freak pictures, caricature photographs, composite photography, doubles, and comical portraits. The published price of the volume is one dollar.—*The Photographic News.*

The entire edition of this work has already been nearly exhausted and a new edition is being prepared. It holds the position of being the best selling book ever issued by the publishers.

NOTES ABOUT PHOTOGRAPHERS.

Alfred Stieglitz has postponed his trip to Europe.

Hinsdale Smith was awarded a bronze medal at the Stanley show in London.

Dr. Nansen made upwards of a thousand photographs during his recent trip to the Arctic regions.

C. P. Goerz has been awarded a gold medal "for industrial progress."

W. B. Post has, we are happy to state, entirely recovered from his recent illness.

Cecil E. Hertzlet, whose picture of a wayside shrine appears on another page, has been appointed British Consel General at Havre.

David Tucker, of Buffalo, announces the marriage of his daughter, Mary Graham, to Dr. Grover William Wende. Our congratulations to the happy pair and the genial father of the bride.

EDGAR G. LEE

Edgar G. Lee is one of England's cleverest hand-camera workers. His snap-shots of street life have made him famous. He is the possessor of a PHOTOGRAPHIC TIMES silver medal.

Wm. A. Eddy, of Bayonne, N. J., has succeeded in making some interesting kite photographs. An illustrated article on the subject from his pen will be published in our next issue. Don't fail to receive a copy,

THE EDITORIAL TABLE

Reviews of Books, Photographs, Apparatus, etc. Received.

The Elements of Stereoscopic Photography. By .C F. Seymour Rothwell, F.C.S. London: Percy Lund & Co., Limited. Price 6d net.

This ever fascinating pastime is thoroughly dealt with in this little manual.

The Half-Tone Process. By Julius Verfasser. Second Edition. London: Percy Lund & Co. Price two shillings.

We have already reviewed this practical manual of the half-tone process. The fact that a second edition is so soon called for is a guarantee of its value.

Messrs. Montgomery, Ward & Co., of 111 Michigan Avenue, Chicago, Ill., send us their illustrated catalogue of photographic apparatus and materials, and, judging from a hasty perusal of its contents, the amateur or professional photographer is well catered for. Practically, everything photographic can be supplied by this firm, which styles itself "Monarchs of the mail order business."

The British Journal Photographic Almanac for 1897. Edited by Thomas Bedding. London: Henry Greenwood & Co.; New York: The Scovill & Adams Co. of New York.

"Bigger and better than ever" must be said about this ever-welcome Annual. The articles are all of practical value, and quite a number of illustrations, by various processes, are scattered through the volume. Many valuable tables are given, several being reprinted from our own Annual, but without credit to that source, a slight mistake that we feel sure the editor will rectify in future editions.

Photographic Mosaics for 1897. Edited and Published by Edward L. Wilson, New York. Price, 50c.

For thirty-three years this little year-book has made its appearance, and we are inclined to believe that the present issue is considerably in advance of its predecessors. Mr. Wilson caters chiefly for the wants of the professional photographers, and no man understands their requirements better than he.

Manual of Photography. By Samuel Reber, First Lieut. Signal Corps, U. S. A. Washington: Government Printing Office.

This handy little manual has been prepared under the supervision of Brigadier-General A. W. Greely, and is intended for the use of the U. S. Army. The author deserves considerable credit for the thoroughness of his work. In a few pages he has condensed a vast quantity of valuable information.

Photograms of '96. Published by Dawbarn & Ward, London. Price, one shilling; cloth, two shillings.

A superb collection of half-tone reproductions of the choicest works exhibited at the recent Salon and Royal Photographic Society. The literary matter accompanying the pictures is from the pens of Gleeson White, Alfred Stieglitz, Josiah Martin, Eldridge Stanton, W. F. Ponder and the staff of the *Photogram*. We advise every student of artistic photography to obtain a copy of this work.

THE FERRY BY E. MAINWARING

PHOTOGRAPHIC PATENTS.

GRANTED DURING THE MONTH OF NOVEMBER, 1896.

(Furnished For The Photographic Times by William S. Hodges, Patent Lawyer, Washington, D. C.)

No. 570,774. **Photographic Camera.** Frederick H. Sanderson, Cambridge, England.

A pair of swinging arms or cantilevers is provided, each of said arms being formed of two longitudinally slotted members, the ends of which are pivoted at suitable distances apart to a support. The slotted members of each cantilever cross each other, and are designed to receive gudgeons carried by the camera front. These gudgeons have pivotal connection with both of the slotted members, and are secured thereto by binding nuts, whereby the camera front is supported wholly by the said arms and can by adjusted in the fore and aft, and up and down directions and likewise about a horizontal axis.

No. 571,085. **Portable Photographic Dark Room.** Walter T. Ferguson, Bickley Mills, Va.

The inventor forms a portable dark room of a collapsible box or cabinet consisting of a flat bottom board, inwardly folding side boards hinged to opposite side edges of the bottom board, and inwardly folding end boards hinged to the opposite end edges of the bottom boards. These end boards are provided on their opposite end edges with corner cleats having at one end short laterally extending feet. A removable top-board is provided on its underside with a peripheral annular groove adapted to receive the projecting top edges of the side and end boards, and when folded inside of the plane of the short feet of the corner cleats is adapted to rest on the side and end boards.

No. 571,314. **Process of Forming Photographic Prints.** Sebastien P. Sampolo and Charles L. A. Brasseur, New York, N. Y.

This is an improvement in the art of forming printing surfaces for color printing from photographs from nature. A subdivided photographic representation is first made, this representation being composed of differing partial images in side by side areas of the representation. Then a separate partial print for and from each partial image is made photographically, after which a printing block surface is produced for and from each partial photo-print.

No. 571,470. **Pack of Photographic Films.** Joseph T. Clarke, Boston, Mass

In carrying out this invention a pack or series of photographic films of two patterns are provided with opposite notched edges. The films are so formed and arranged in alternate sequence that the notches of the films of odd number in the pack correspond to the projections between the notches of the films of even number, and vice versa.

No. 571,496. **Kinetoscope.** Adolph Pettenkofer, Brooklyn, N. Y.

A kinetoscope constructed with a stationary block having a sharp angle or shoulder formed thereon, and an endless belt adapted to travel around said block and over said angle, and pictures secured at one end to said tape or belt and extending at an angle therefrom.

No. 571,632. **Flash Light Apparatus.** Joseph Wolf, Rochester, N. Y.

A powder reservoir is provided with an adjustable bottom and air or gas inlet pipe, a powder exit pipe, a funnel and an igniting device. The inlet and exit pipes communicate directly with the upper surface of the powder so that the latter may be discharged by a blast on its unobstructed surface, and the charge maintained at an approximately constant level.

No. 571,642. **Photographic Retoucher.** Samuel G. Bradford, Benton Harbor, Michigan.

A photographic retouching tool is provided with a tubular handle which is adapted to carry a cylindrical case or housing. A wind motor is mounted on a suitable operating shaft and arranged within said cylindrical casing or housing. A flexible air tube is connected with the latter by means of a nozzle, and eyes or loops are fastened to the handle and designed to embrace said tube. An automatic spring actuated cut-off is adapted to engage the air tube and pinch the same whereby the air passage therein is closed.

No. 571,716. **Stereoscope.** Hawley C. White, Bennington, Vt.

An eyepiece for stereoscopes is formed of a tubular piece provided with a lens, the end which contacts with the user's face being fitted to the orbit of the eye by having an outer projection fitted to the temple, and an inner projection fitted to enter the sunken depression at the inner corner of the eye beside the nose.

No. 571,806. **Camera.** Philip K. Stern, St. Louis, Mo., assignor to Stern Manfg. Co., same place.

A camera is provided with an internal mirror normally inclined at an angle to the optical axis of the same, a focusing screen being set at right angles to the focal plane of the camera. Means are provided for transferring an image from the focusing screen to the focal plane. A shutter is also provided for controlling the exposure of the sensitized material, and a diaphragm stop is arranged normally out of register with the optical axis of the camera and adapted to cooperate with the shutter.

Daylight enlarging is usually done with a solar camera (see under **Camera**), but a simpler contrivance can be made as follows:

All light from the window is blocked out, excepting a small space a little larger than the negative from which an enlarged positive is to be made. The negative is placed in the dark slide, and the two slides drawn out, and the black partition removed. The camera is fixed as close as possible to the hole, and outside the window is placed a mirror or a large white card at an angle of 45°, so as to reflect the light through the negative. At a distance from the lens is placed an easel or board to receive the sensitive paper or plate. No light enters the room except that which passes through the negative and lens to form the enlarged image. This method of daylight enlarging is, for some reasons, to be preferred, but the standard of illumination is not constant. With artificial light properly arranged good effects are obtained, and with this method it permits of the work being done in the evening or at night-time.

Of all artificial lights the electric is undoubtedly the best, but this is unfortunately beyond the reach of a great majority. Limelight is also very suitable, and now that compressed oxygen is obtainable anywhere its use is much simplified. Gas may also be used. The best arrangement is that known as the albo-carbon gaslight. In this the gas passes through paraffin wax, and its brilliancy is thereby considerably increased. Acetyline gas will also be used in the future as soon as a convenient method of using it is employed. Oil lamps can also be used.

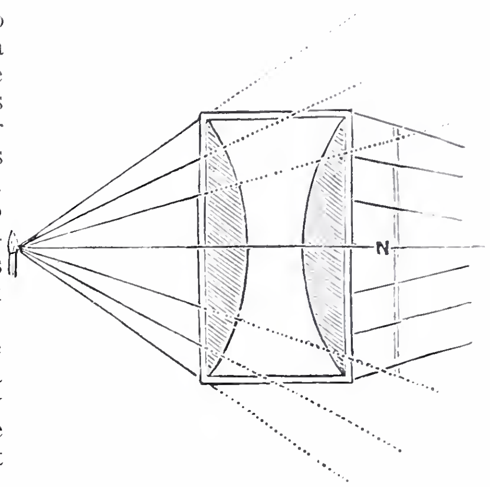


FIG. 177.

The principal method of obtaining even illumination with artificial light is by means of condensers. This is, however, expensive, as an eight-inch condenser is the smallest that will do for a half-plate negative. The function of the condenser is to turn the diverging rays that impinge upon it into a bundle of converging rays, and the enlarging lens must be placed where it can best receive as much of the light as possible that passes through the condenser. The form of condenser usually employed is shown in Fig. 177. It consists of two plano-convex lenses mounted with the convex face inwards. It will be seen that but few of the rays would pass through the negative N were they allowed to proceed in the direction of their propagation, as shown by the dotted lines.

A condenser is not, however, absolutely necessary, provided a perfectly unifom surface can be produced. Ground glass, although often recommended, is but an imperfect diffuser; opal glass is superior. If this is placed halfway between the negative and four or six gas burners arranged in a group, a fairly even illuminant is obtained.

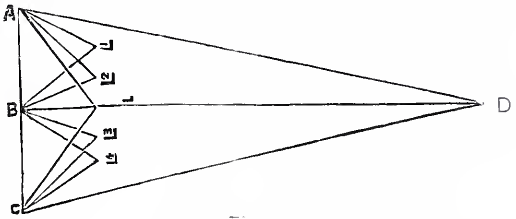


FIG. 178.

In order to better understand what even illumination means, we must take a glance at a book on elementary optics. In Fig. 178 we will suppose A B C to be a negative, L a source of light, the rays of which proceed from a point.

The lines L A L B will be the relative intensities, and it will be seen that by no means can even illumination be obtained. If the light be removed to D, although its intensity will be greatly diminished, even illumination will be secured. But to do this we must employ a very bright light, such as the electric one. Supposing, however, we substitute a much larger luminous surface by placing lights also at L_1, L_2, L_3 and L_4, it is easily seen that a much more even illumination is obtained. The distance from L to A or to C is not of any importance, as these parts are lighted up by L_1 and L_4. Another plan is to move the light, but this must be done in an equal direction, and with a perfect regularity of speed.

The lens used should be, if possible, the lens with which the negative was made. Failing this, a doublet or some other kind of lens must be used. If a single lens, the convex face must be turned towards the negative.

The lantern consists essentially of a box made to contain the light and the condensers. It should be capable of standing a great amount of heat, and should, as far as possible, be light-tight. The only light emerging from it must be through the negative. Fig. 179 is a sketch of an enlarging lantern.

Enlarging on Bromide Paper.—Bromide paper is the simplest to work with. There are several different kinds. With some, much better tones are obtained than with others. The paper is supplied ready sensitized in rolls, and can be obtained either with a smooth or rough surface. For large work the rough surface usually has the more artistic appearance.

A piece of white paper is attached to the movable screen, and upon this the image of the negative is sharply focused The lens is then capped with a piece of yellow paper or glass, and the piece of sensitive bromide paper fixed firmly into its place. A small stop may then be placed in the lens to give increased sharpness. Exposure is made by uncapping the lens, but the precise duration required is only found out by practice. It differs with every kind of negative, with the strength of the illuminant, and with the distance of the screen from the camera. With regard to the first two points no law can be given, but it is not a difficult matter to find out the relative exposures required for images placed at different distances from the camera as these are regulated by the following law: "*The intensity of illumination on a given surface is inversely as the square of its distance from the source of light.*"

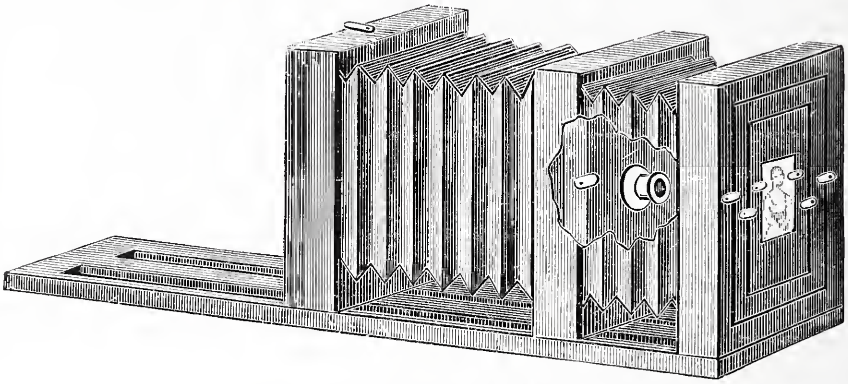


FIG. 179. ENLARGING CAMERA.

We see this more clearly in Fig. 180. Here a candle is the illuminant. Now suppose the bromide paper be placed at 1 (one foot away), and the exposure required was 30 seconds. If we remove it to 2, or two feet away from the candle, the exposure required would be four times as great, or two minutes, while at 3, or three feet from the illuminant, it would be nine times as long, or 4½ minutes, while at 4 it would require an exposure of eight minutes, or 16 times as long as at 1.

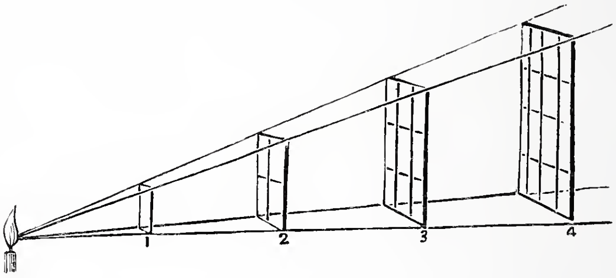


FIG. 180.

But even this useful law does not help us unless we know the correct exposure with a given negative at a given distance, and with a given illuminant. To prevent large pieces of the sensitive paper from being spoilt, it would be advisable to make the first attempts upon small pieces only until the correct exposure is ascertained.

The distance to place the screen from the camera lens to obtain the image the necessary number of times enlarged is easily found by reference to the tables given on page 135. It is necessary only to know the focal length of the lens, and turn to that column to obtain, first, the distance of the sensitive paper from the lens, and, secondly, the distance between the negative and the lens. Thus if the focal length of the lens be 9½ inches, we turn to the column headed 9½. On the left of the page will be found the number of times of enlargement or reduction, as the case may be. Supposing, for instance, we desire to enlarge four times linear (*i e.*, sixteen times in area). We refer to ¼, and under column headed 9½ we find 3 feet 11½ inches and 11⅞ inches, the first being the distance of the screen from the centre of the lens, and the second number the distance of the negative from the len's centre.

The negative to be enlarged should be as sharp as possible, as any ill-defined parts have a very hazy and indistinct appearance in the enlarged image.

Vignetting can be done by putting a vignetting glass in front of the negative, or if an easel be used a suitable hole is made in a piece of carboard, and this is held in the hand and moved to and fro between the lens and easel during exposure, the rays of light passing only through the aperture in the cardboard.

Clouds may also be printed in. This is best done by cutting out in black paper the shape of the landscape portion of the picture, and this is pasted on to a piece of clean glass the same size of the negative. It is then placed on the lantern, together with a cloud negative, and the bromide paper is thus exposed for a few seconds only. It is then removed, and the landscape negative inserted and exposed. On developing, the landscape and clouds will appear simultaneously.

Development of the exposed bromide paper is usually done with the ferrous-oxalate developer, although pyro or other developers, may be used. The paper is laid on a large and shallow dish, and a little water poured over it. With a camel-hair brush all air-bells are removed. The water is then drained off, and some weak developer poured on. Make up three stock solutions, the first with a pound of potassium oxalate, dissolved in a quart of water ; the second, six ounces of granulated sulphate of iron and 50 grains of tartaric acid, dissolve in 16 ounces of water, and the third a ten per cent. solution of ammonium or potassium bromide. These solutions should be labelled 1, 2 and 3 respectively. For use, take eight parts of No.1 , and add to it one part of No. 2 and half a minim of No. 3. It is advisable to first use a very weak developer until the image makes its appearance, when the operator should be able tell the best strength of the developer required. If a vigorous print be desired, a developer strong in iron should be used. Exposure should always be as full as possible; with an under-exposed print nothing can be done to get a really satisfactory image. Fuller particulars for working with bromide paper will be found under that heading. After development the pictures are well rinsed, and fixed in a one to six fixing bath. They are then well washed in several changes of water, and hung up to dry. When dry, they can be worked up with crayon or lamp-black.

Enlarging on Plain Paper —Enlargements may be made upon plain paper in the following manner. A good quality of plain paper is salted with the solution—

Sodium chloride	200 grains
Hydrochloric acid	12 minims
Water	24 ounces

The paper is immersed for about a couple of hours, when it is hung up to dry. When dry it is floated for about three minutes upon a silver bath composed of

Silver nitrate	1 ounce
Citric acid	8 grains
Water (distilled)	8 ounces

As soon as moderately dry, the paper may be pinned on to the enlarging screen, and the image of the negative thrown on to it. A faint image only will be visible, but this is developed with

Pyrogallic acid	2 grains
Citric acid	1 grain
Water	1 ounce

As soon as developed it is well washed, and, if desired, it can be toned. The print is then fixed in

Sodium hyposulphite	1 ounce
Water	16 ounces

and should remain until all trace of color in the high-lights has disappeared.

Enlarging on Albumen Paper.—Enlargements may also be made upon albumenized paper. The paper should be sensitized on a bath composed as follows:

Silver nitrate	40 grains
Glacial acetic acid	30 minims
Water	1 ounce

After exposure the paper is developed with

Gallic acid	3 grains
Acetic acid	5 minims
Water	1 ounce

The paper is immersed in this solution, and development will take place very rapidly. When sufficiently developed it is removed from the dish and well washed. It can then be toned and fixed.

Enlarging by Collodion Transfer Process.—Enlargement by the collodion transfer process is not employed now to the extent that it was formerly. The following is a *résumé* of the process. The collodion to be used may be any good negative collodion, which has been prepared for a few months at least, as the older it is the purer will be the image. This is diluted by the addition of from one-third to an equal part of a plain uniodized collodion. This addition is to insure a fine, soft gradation of tints, from the highest light to the deepest shadow. The following is a good formula:—To 25 ounces of a plain collodion, containing about seven to eight grains of pyroxyline per ounce, add a bromo-iodizer composed of

Cadmium iodide	65 grains
Ammonium iodide	25 grains
Cadmium bromide	19 grains
Ammonium bromide	11 grains
Alcohol	5 ounces

A small quantity of an alcoholic solution of iodine is then added to give a deep sherry color, but this is not necessary if the collodion be allowed to stand two or three months after mixing and before using. Glass plates, previously rubbed with French chalk, are coated with the collodion.

The silver bath should not exceed twenty grains to the ounce. With regard to the exposure, that, as in nearly every other case, can only be ascertained by experiment, but usually varies in a solar camera between thirty to sixty seconds, according to the quality of the negative and the actinicity of the daylight. The developer is—

Pyrogallic acid	100 grains
Citric acid	60 grains
Acetic acid	2 ounces
Water	20 ounces

Development should not be carried too far. Fix with hypo-sulphite of soda. After fixing and washing, a sheet of transfer paper (previously soaked in cold water for a few minutes until it feels slightly slimy) is laid face downwards upon the collodion picture squeegeed thorougly into contact with it, and allowed to dry spontaneously. When dry it can be raised at one corner with a knife, and the whole stripped away from the glass, taking with it the collodion picture.

The picture has an exceedingly glossy appearance, and can be mounted on to cardboard, and, if desired, finished off in oil colors, without any preparation being required. If the collodion picture be stripped off before it is perfectly dry a duller surface is given.

The transfer paper used in this process is made by soaking four ounces of gelatine in a quart of water and dissolving it. Four grains of chrome alum are then added. Good stiff paper cut into sheets is then floated on the surface of the gelatine, which is kept warm by means of a water bath.

Enlarging on Canvas.—See **Printing.**

Enlarging by Dusting-on Process.—This is a process suitable for making enlargements on opal. A transparency is first made, as by this method a positive is produced from a positive. The plate is coated with the following solution:—

Dextrine	40 grains
White sugar	50 grains
Ammonium dichromate	20 grains
Glycerine	4 or 5 drops
Water	2 ounces

When dry it is exposed to the image of the transparency, after which powdered blacklead is brush over with a soft camel-hair brush. The fine powder adheres to those portions that have not been acted upon by the light. The plate is then coated with collodion, washed in dilute hydrochloric acid, and afterwards in water. It is then dried.

Carbon Enlargements.—This process is undoubtedly the finest one for the production of enlargements, as not only beautiful results are obtained, but these results are permanent, and will outlive all the silver pictures by many years. Carbon enlargements can be most successfully made in a solar camera, although the usual proceeding is to make an enlarged reversed negative, and from this to print the carbon positives by the single transfer process. (For details of the process see **Carbon Process.**)

The process of making enlarged negatives is very similar to that required for positives, except that a positive be placed in the lantern, and the image thrown upon a dry plate.

EOSIN.—There are two kinds of eosin, *i. e.* Tetra-bromo-fluoresceïn, potassium or yellow shade eosin. $C_{20}H_8Br_4O_5K_2$—M. w. 261 and tetra-bromo-fluoresceïn sodium or red shade eosin with a formula $C_{20}H_6Br_4O_5Na_2$.—M. w. 692. It is used in the orthochromatic process as a sensitizer to the yellow and green rays, soluble in water alchohol and benzine. See **Orthochromatic Process** and **Fluorescein.**

Commercial eosin is rarely found with a sufficient degree of purity for commercial purposes. The following method is given for its purification:* Dissolve 20 grammes of eosin in 700 c.c. of boiling water, and after dissolution add sulphuric acid 1:10 until no further precipitate of bromo-fluoresceïn is formed. The liquid is separated by decantation, and the salt washed and dried. The purified excess is insoluble in water but soluble in alcohol.

EPSOM SALTS.—See **Magnesic Sulphate.**

EQUATION, CHEMICAL.—A symbolic representation of a chemical reaction. (See **Chemistry.**)

EQUIVALENCY, CHEMICAL.—The quality in elements of combining with, or displacing one another in certain definite proportions. When the atomic weight is taken into consideration the equivalency of an element is termed its atomicity.

EQUIVALENT FOCUS.—See **Focus.**

ERYTHROSIN.—An iodo derivative of Fluoresceïn (*q. v.*) The two kinds used in photography as dye sensitizers in the orthochromatic process are erythrosin M— tetra-bromo-fluoresceïn potassium or sodium. Formula, $C_{20}H_6I_4O_5K_2$ or Na_2.—M. w. 912, and Erythrosin G—Di iodo-fluoresceïn potassium or sodium. Formula, $C_{20}H_6I_2O_5K_2$ or Na_2.—M. w. 660.

---

* "British Journal Almanac, 1894."

ESSENTIAL OILS.—Oils, usually obtained from plants, which are volatile either alone or with steam. (See **Volatile Oils.**)

ETCHING.—(See **Photo-etching.**)

ETCHING SOLUTION.—A solution used in photo-zincographic and engraving processes. A solution for etching zinc is made up as follows:—

Nitric acid	1 drachm
Water	10 ounces

An etching solution for copperplate is:—

Solution of perchloride of iron	1 ounce
Water	6 ounces

ETHER.—(Formula, $C_4H_{10}O$; molecular weight=74; synonyms *ethylic oxide*, *ethylic ether*, *vinic ether* and *sulphuric ether*).—An exceedingly volatile, colorless liquid, prepared from alcohol by the action of sulphuric acid at an elevated temperature. Alcohol is first placed in a retort, and about an equal volume of sulphuric acid is added to it. This addition immediately develops heat, and by raising the temperature ether vapor passes away with a proportion of alcohol. A stream of alcohol is made to pass into the still, and the heat regulated at a temperature of about 266 deg. As soon as five volumes of alcohol have been added, the temperature is raised to 286 deg., at which point the impurities commence to pass over. Ether thus obtained contains sulphuric acid, alcohol and water. These are subsequently removed by heating with a calcium chloride solution.

The action that takes place in the manufacture of ether after this method is rather interesting—

$$\overset{\text{Sulphuric Acid.}}{H_2SO_4} + \overset{\text{Alcohol.}}{C_2H_5OH} = \overset{\text{Ethyl Sulphuric.Acid.}}{C_2H_5HSO_4} + \overset{\text{Water.}}{H_2O}.$$

Thus the sulphuric acid acts on the alcohol, forming ethyl sulphuric acid and water. This acid is again acted upon by alcohol, producing the re-formation of sulphuric acid and ether, thus—

$$\overset{\text{Ethyl Sulphuric Acid.}}{C_2H_5HSO_4} + \overset{\text{Alcohol.}}{C_2H_5OH} = \overset{\text{Ether.}}{(C_2H_5)_2O} + \overset{\text{Sulphuric Acid.}}{H_2SO_4}.$$

The sulphuric acid is restored again, and can be used to attack more alcohol to form fresh ether. This action goes on until the acid becomes too weak, owing to the water in the first action diluting it.

Ether has a strong, sweet odor and a burning taste. Its vapor is very heavy, and highly inflammable. It has a specific gravity of about ·730 at a temperature of 60 deg. It boils at 96 deg, forming a heavy vapor two and half times as dense as air, and freezes at—24 deg. If a small portion be poured into the palm of the hand it will be found to vaporise so quickly that it will produce the most intense cold. It is so highly inflammable that it is not advisable to work with it in a room that has a naked light, unless with great care. If inhaled too freely it will also produce drowsiness and complete insensibility. If equal bulks of water and ether be added, and well shaken together. the liquids will appear to separate, but the ether will have taken up about one-eighth of its volume of water, and the water has dissolved the same amount of ether. If it absorbs more it is fairly good proof of the presence of alcohol.

If pure ether be exposed to the light it ozonises and becomes acid, and in this state it is liable to decompose photographic substances placed in it. It is, therefore, advisable to keep it in a dark, and also a cool, place. The presence of water in ether is detected by dropping a little into a flask containing spirits of turpentine. If it be present it will cause instant turbidity, but otherwise it will unite perfectly. If ether contains much water it is gradually converted into alcohol and finally into acetic acid.

The employment of ether in photographic operations is very large, owing to its properties of dissolving iodine, bromine, sulphur, phosphorus, as well as of essential oils, corrosive sublimates, and other salts. It mixes with alcohol in all proportions, and is thus used in the manufacture of collodion.

The presence of oxidation products will cause the collodion to turn brown, owing to the liberation of iodine. This color can be removed and the collodion restored to its proper sensitiveness by shaking it up with metallic cadmium.

Methylated Ether is prepared in the same manner as above described, except that methylated spirit is used instead of alcohol.

If properly rectified and purified it answers very well for the manufacture of collodion, and is much cheaper than ethylic ether. Before using it, however, it should be quite free from methyl, and should not have become ozonized by exposure to light. Test for this in the manner given.

ETHYL ACETATE.—(Acetic ether, $C_4H_8O_2$).—Prepared by heating concentrated sulphuric acid to 130 deg., and then allowing a mixture of 60 parts of glacial acetic acid and 46 parts of 93 per cent. alcohol to run slowly into the flask. The ether distils over and is washed in a solution of soda, and then dried over calcium chloride. Ethyl acetate is a fragrant, colorless, limpid liquid. It is soluble in 17 parts of water; 28 parts of the ether dissolve in one part of water. It boils at 73 deg.

ETHYL ALCOHOL.—Obtained from acetic acid by converting the acid into acetyl chloride by distillation with phosphorus penta-chloride, and acting on a mixture of acetyl chloride and glacial acetic acid with sodium amalgam, which decomposes the acetic acid, liberating hydrogen, which acts on the acetyl chloride, converting it into aldehyde, which, by the further action of hydrogen, is converted into alcohol, and this is converted by acetyl chloride into acetic ether. This is then saponified by distilling with potash, yielding potassium acetate and ethyl alcohol.

ETHYL ETHER.—See **Ether.**

EURYSCOPE.—A name given to a kind of wide-angle lens.

EVAPORATE.—To transform into vapor. Liquids evaporate at temperatures below their boiling point. The rising vapor converts sensible into latent heat, with the effect of producing cold.

EVAPORATING DISH.—Dish for evaporating solutions. Enamelled "Agate" dishes, as shown in Fig. 181, serve their purpose well, as they are not acted upon by the vegetable acids.

EXCITING.—See **Sensitizing.**

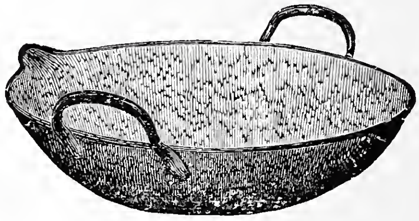


FIG. 181.

EXPANSION.—All substances, whether gaseous, liquid or solid, when chemical change does not take place, expand more or less by heat, and contract by cold. This property should be carefully noted. Glass, for instance, expands very considerably by heat, and if the expansion be unequal it will crack. Any glass vessel into which hot water is to be poured should be previously warmed, unless the glass be very thin, when this precaution is not necessary.

Moisture will also cause expansion. This, with gelatine films, is often very annoying, as it causes them to leave the glass. The only remedy is to lay the plate in a strong solution of alum or alcohol.

EXPLOSIVE POWDER.—A powder used in the flast-light process of illuminating during exposure. (See **Flash-light.**)

EXPOSURE.—By exposure is meant the exposure to the action of light any sensitive surface, either in the camera to the image formed by the lens, or behind a negative in a printing frame. The exposure being the most important of all the photographic operations, it is lamentable that but little useful information can be given upon the subject. The proper knowledge of the length of the exposure is only attained by practical experience. With such sensitive substances as albumenized paper, or with any other printing-out process, the difficulty of exposure is reduced to a minimum, as the operator can see the image, and by attention stop the progress of the action of the light at the right moment required. With dry plates, however, or with any other process in which the image is invisible it is a very different matter The exposure of the dry plate is the most important point, as unless correctly exposed a satisfactory picture can rarely be made. The exposure of the plate is principally governed by the following:—(1) The subject to be photographed, its distance from the camera, and darkness of the shadow detail; (2) the rapidity of the lens, and its working aperture; (3) the actinicity of the daylight; and (4) the rapidity of the plate.

There have been many tables and arrangements invented for calculating the necessary exposure, but some of which are more likely to lead to confusion to the beginner than to aid him. The actinicity of the light varies so with the different days, or even times of the day, and some subjects require so much longer exposure than others, that this information can only be got by

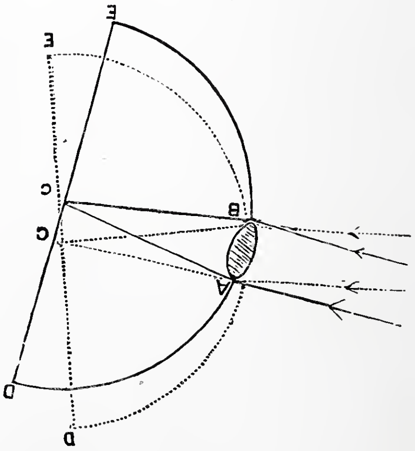


FIG. 182.

practice. There is, however, a law relating to the comparative exposures required with different stops or diaphragms. The stops are usually marked with their fractional value, found by dividing the focal length of the lens by the diameter of their apertures. If all other conditions be precisely the same, the exposures required are proportional to the squares of the denominators of these fractions.

In exposing a plate, probably the best guide is the image upon the ground glass focusing screen. If the same kind of plate be always used, the operator, by examining the appearance of image, will soon be able to judge the correct exposure almost immediately. The following table might be useful as giving some idea of the proportional exposures necessary with a moderately quick plate and working with a lens aperture of *f*/16 with a good light.

Sea and sky	$\frac{1}{10}$ second
Animated scenes	$\frac{1}{5}$ second
Landscape, distant	$\frac{1}{2}$ second
Landscape, little foreground	1 second
Landscape, dark foliage foreground	2 seconds
Buildings	2 seconds
Interiors, well lighted	3 minutes
Interiors, badly lighted	45 minutes
Outdoor portraiture	5 seconds

The measurement of the light value is a very difficult proceeding, and cannot be accurately determined by exposing a piece of sensitive paper.

The rapidity of plates is also very confusing. Warnerke's sensitometer is usually employed, and plates are sold by manufacturers of various sensitometer numbers, as "30 times," "60 times," etc., intended to represent the number of times the plate is more sensitive than a wet collodion plate. But no reliance at all can be placed on these, some experiments proving nearly all to be incorrect, and some not possessing one-half the sensitiveness they were stated to have.

The following tables by Professor Burton and S. W. Very may also be fonnd of use in estimating comparative exposures:—

PROF. BURTON'S TABLE OF COMPARATIVE EXPOSURES.

Aperture calculated on the Standard System of the Photographic Society.	Sea and Sky.	Open Land-scape.	Landscape with Heavy Foliage in Foreground.	Under Trees up to	Fairly lighted Interiors.	Badly lighted Interiors up to	Portraits in Bright Diffused Light out of Doors.	Portraits in Good Studio Light.	Portraits in Ordinary Room.
	SEC.	SEC.	SEC.	M. S.	M. S.	M. S.	SEC.	M. S.	M. S.
No. 1 or $\frac{f}{4}$	$\frac{1}{160}$	$\frac{1}{50}$	$\frac{1}{8}$	0 10	0 10	0 2	$\frac{1}{6}$	0 1	0 4
No. 2 or $\frac{f}{5.656}$	$\frac{1}{80}$	$\frac{1}{25}$	$\frac{1}{4}$	0 20	0 20	0 4	$\frac{1}{3}$	0 2	0 8
No. 4 or $\frac{f}{8}$	$\frac{1}{40}$	$\frac{1}{12}$	$\frac{1}{2}$	0 40	0 40	0 8	$\frac{2}{3}$	0 4	0 16
No. 8 or $\frac{f}{11.314}$	$\frac{1}{20}$	$\frac{1}{6}$		1 20	1 20	0 16	$1\frac{1}{3}$	0 8	0 32
No. 16 or $\frac{f}{16}$	$\frac{1}{10}$	$\frac{1}{3}$	2	2 40	2 40	0 32	$2\frac{2}{3}$	0 16	1 4
No. 32 or $\frac{f}{22.627}$	5	$\frac{2}{3}$	4	5 20	5 20	1 4	$5\frac{1}{3}$	0 32	2 8
No. 64 or $\frac{f}{32}$	$\frac{2}{5}$	$1\frac{1}{3}$	8	10 40	10 40	2 8	$10\frac{2}{3}$	1 4	2 [illegible]
No. 128 or $\frac{f}{45.225}$	$\frac{4}{5}$	$2\frac{2}{3}$	16	21 20	21 20	4 16	21	2 8	8 32
No. 256 or $\frac{f}{64}$	$1\frac{3}{5}$	$5\frac{1}{3}$	32	42 40	42 40	8 32	42	4 16	17 4

In the exposure of bromide paper it is usual to make a few experiments upon small pieces of paper. When once the correct exposure has been obtained it is possible to expose any number correctly, provided the same negative be used, placed at the same distance from the same light, and provided artificial light such as a gas flame be used.

In exposing platinotype or carbon paper, actinometers will considerably aid the operator in judging the exposure time.

DIAGRAM OF COMPARATIVE EXPOSURES.

Computed for the latitude of Washington, D. C. (38 deg., 54 min. N.)

By Lieut. Commander S. W. Very, U. S. N.

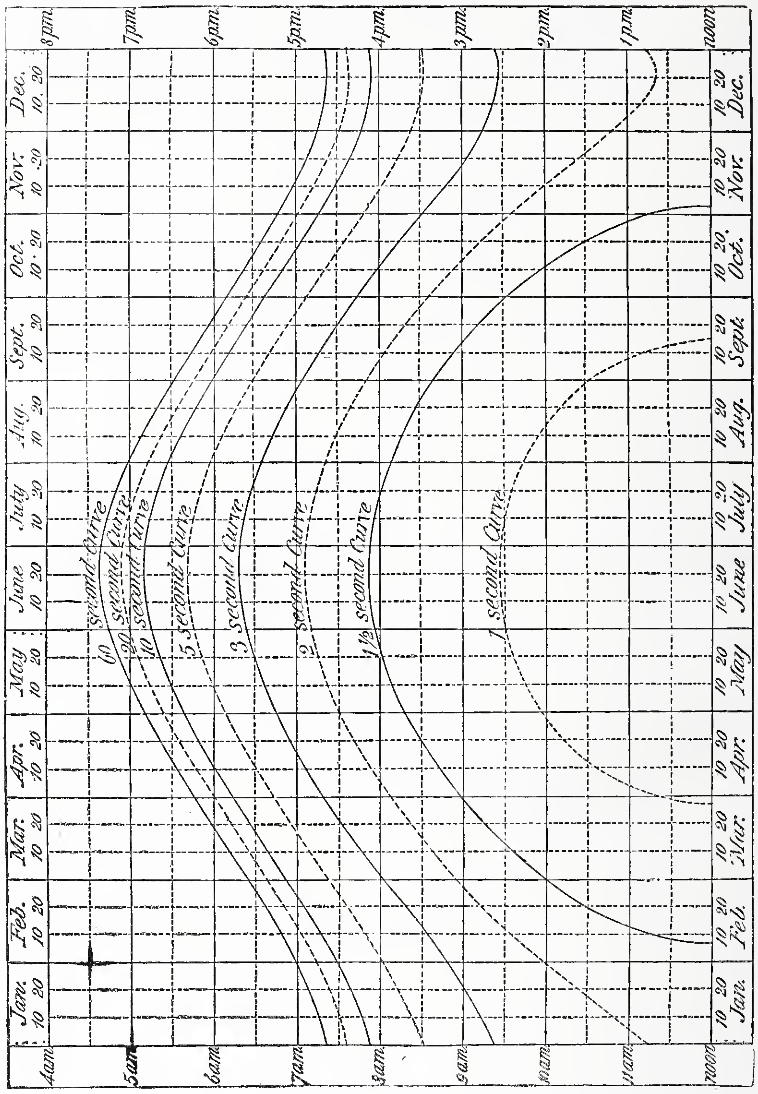


FIG. 183.

The straight lines in this diagram represent divisions of time; the vertical ones showing the month and day, and the horizontal ones the time of day as shown by a sun-dial.

The curved lines are curves of equal altitudes of the sun, computed for the latitude of Washington, for the year 1889.

The combination of the two systems of lines is designed to enable the photographer, whether amateur or professional, who has at some time determined the length of exposure required under certain circumstances of subject, clouds, lens, diaphragm, plate or film, etc., to decide what exposure to give *under the same circumstances*, at any time between sunrise and sunset, on any day of the year.

The diagram is based upon one constructed for the latitude of London, published in the *Photographic News*, in 1887, and reprinted in the Annual of 1888, and the same standard of comparison is used in this adaptation—that is, such circumstances of subject, clouds, lens, diaphragm, plate or film, etc., as will require an exposure of one second, at noon of any day between the 4th of April and the 7th of September, or at any time between a quarter to ten in the forenoon and a quarter past two in the afternoon on the 21st of June.

The diagram, although constructed for the year 1889, and for the latitude of Washington, will serve equally well for any other year, and well enough for ordinary purposes, throughout the United States (exclusive of Alaska), although in the extreme Northern and Southern belts it will not be accurate.

The diagram is strictly accurate for "apparent time" only, but it is sufficiently so for "local mean time" (which may differ sixteen minutes from "apparent time"), and in the great majority of places for "standard time" (which in some places differs half an hour from "mean time," and may differ three-quarters of an hour from "apparent time)."

EXAMPLES.

Q. With a certain lens, diaphragm, etc., it is found that on the 20th of July, at 9.30 A.M., a certain subject requires three seconds' exposure; what time should be given on the 10th of December, at 3:30 P.M., the subject, lens, etc., being the same.

A. Fifteen seconds.

Q. At noon of the 15th of May, a certain subject required ten seconds; what length of exposure should be given to the same subject, with the same lens, diaphragm, etc., on the 1st of November, at 8 A.M.?

A. Forty-five seconds.

TABLE OF COMPARATIVE LIGHT VALUES.

By Rev. Dwight W. Smith.

While there is a wider range in timing the exposure of a dry plate than is generally supposed, yet it is well known that there is but one correct interval for the best results with a normal developer. To best approximate that interval at all available hours of the day and year requires some attention and experience. There was a time when plates of a given brand and sensitiveness were quite unreliable, but now that they are so uniform, and improving more and more in this direction, tables of light values that were found to be comparatively useless will now be found of increasing value. The subjoined table, based upon the diagram in this book, by Lieutenant S. W. Very, U. S. N., has been computed for the first half of each month, and at a glance one may obtain information that would otherwise require time and trouble, aud that even skill and experience does not always provide for, especially during the time indicated in which there is a rapid loss of light. It will be seen that in January, the light value for noon is given as 1.7, while at 4 P.M., the exposure would necessarily be more than five times that duration. For July, the most rapid as well as longest available light of any month, the light at noon is indicated by .2 instead of 1.7, and at 3 P.M. more than twice the time will be required.

The first column indicates the hour of the day; the second column the comparative light values in whole numbers and tenths.

January.		February.		March.		April.		May.		June.	
8	10	8	6	8	3	8	2	8	1.7	8	1.7
9	4	9	4	9	2	9	1.5	9	1.2	9	1.2
10	2.5	10	2	10	1.5	10	1.7	10	1	10	1
11	2	11	1.7	11	1.2	11	1	11	.7	11	.6
12	1.7	12	1.5	12	1	12	1	12	.5	12	.3
1	1.7	1	2	1	1	1	1	1	.7	1	.5
2	2.5	2	2.7	2	1.7	2	1.2	2	1	2	.7
3	4.5	3	3.5	3	2	3	1.5	3	1.2	3	1.2
4	9.5	4	5	4	4	4	2	4	1.5	4	1.5
		5	60	5	20	5	4	5	2.7	5	2.2
						6	20	6	15	6	5
								7	80	7	20

July.		August.		September.		October.		November.		December.	
8	1.5	8	1.7	8	2	8	3	8	4	8	9
9	1.2	9	1.5	9	1.5	9	1.7	9	3	9	3
10	1	10	1	10	1	10	1.5	10	2	10	2
11	.5	11	.7	11	1	11	1.2	11	1.7	11	1.5
12	.2	12	.5	12	.5	12	1	12	1.5	12	1.7
1	.5	1	.5	1	1	1	1.2	1	1.5	1	2
2	1	2	1	2	1.2	2	1.5	2	2	2	2.5
3	1.2	3	1.2	3	1.5	3	2	3	2.5	3	3.5
4	1.5	4	1.7	4	2	4	2.7	4	5	4	8
5	2.2	5	2.5	5	3	5	6	5	20	5	80
6	4	6	5	6	10	6	40	6	70		
7	15	7	60								

FABRIC.—Photographic fabric is a name generally given to a translucent cloth dyed of a golden yellow or red color, and used for dark room windows. It is always advisable to use two thicknesses, as there are usually a number of fine holes, almost invisible, but which, at the same time, allow of the entrance of white light.

FADING.—A sad defect to which negatives and prints (particularly silver prints) are liable.

The cause of negatives fading is usually insufficient fixing with the sodium hyposulphite, or the incomplete removal of the hyposulphite from the film after fixing. The remedies are obvious.

The fading of silver prints has long occupied the attention of scientists who, apparently, have not yet arrived at any really satisfactory conclusion.

The most important causes of unmounted photographs fading are probably—First, the imperfect coagulation of the albumen and the presence of some organic matter liable to rapid decomposition liberating sulphurous gases, which attack the silver. Sulphur is the most dangerous substance to be present in the print. Albumen, unfortunately, contains minute quantities of it, which probably give rise to some compound of silver and sulphur. This is, perhaps, why prints upon gelatino-chloride papers are so much more permanent than upon albumenized paper, although the ingredients are almost precisely the same, except that the silver salts are held in gelatine instead of albumen. A second cause of the fading of prints may be in the insufficient deposit of gold in the toning process. Prof. W. K. Burton recently pointed out that the less gold a sample of paper required to tone it, the less likely would be that paper to produce permanent prints, and it should therefore be rejected. A third cause of fading is the trace of organic salts of silver remaining in the film as a compound of albumen and the metal. The presence of this causes the print to decay slowly. Its action can be arrested by treating the prints with bichloride of mercury, a very powerful antiseptic and coagulator of albumen. Yet another cause of faded prints is in the insufficient fixing or removal of the sodium hyposulphite from the paper prints. It is not an easy matter to tell exactly when prints are fixed, and there is no doubt whatever that many make the mistake of removing them too soon from the bath.

In the removal of the hypo from the prints a great deal of the probable permanency depends. The washing of the prints should be rapid and thorough. If a print be laid a few minutes in clean cold water, kept moving about and then removed, the water allowed to drain off and the print placed in a fresh supply of cold water, and this operation repeated, say, ten or twelve times, the print will in one hour have received a more thorough freeing from hypo than it would have done had it been placed in a running stream of water for 24 hours.

There are a number of solutions for removing the fixing salts (see **Eliminator**), but none is to be recommended. Water, changed frequently, is the best eliminator.

With regard to mounted photographs, fading can very often be traced to the mount or to the mounting solution employed. In the manufacture of mounts hyposulphite of soda is often used as an anti-chlor. This should be tested for, and the mounts containing it discarded. The mountant should be as pure and as simple as possible.

FAHRENHEIT THERMOMETER.—A thermometer introduced by Fahrenheit in 1714, and still largely used in England. In this scale the freezing point of water is + 32 degs., and the boiling point of water + 212 degs., leaving 180 degs., between them. In the centigrade thermometer used on the Continent the space is divided into 100 degs., freezing point being 9 degs., and boiling point 100 degs. To reduce Fahrenheit degrees to centigrade, subtract 32, multiply by 5, and divide by 9.

FALLING FRONT.—See **Rising Front.**

FALSE DISPERSION.—See **Dispersion.**

FALSE PERSPECTIVE.—See **Perspective.**

FERRIC AMMONIUM CITRATE.—Formula, $Fe_2 (NH_4)_2 (C_6 H_5 O_7)_3$. (Synonym *ammonia citrate of iron*). Occurs in thin, nearly transparent, brownish scales, and should be kept in the dark as light oxidises them. It is soluble in water and alcohol. To manufacture it Leaper gives the following instructions: Mix in a 30 ounce flask 4 drachms of strong sulphuric acid with 7 ounces of water, and having raised the liquid to boiling, dissolve 6 ounces of ferrous sulphate in it. Now add half an ounce of strong nitric acid, diluted with 2 ounces of water, to the mixture, and continue boiling until the iron is completely oxidized, as is evidenced by its ceasing to give a blue precipitate with potassium ferricyanide. Next precipitate the iron completely with an excess of ammonia, well wash the precipitate and boil it for five minutes with 4 ounces of citric acid dissolved in 10 ounces of water. Filter the mixture and when cool add to it 3½ ounces of ammonia s. g. .96. Filter again, evaporate to dryness at 100 degs. C., and keep the residue in a stoppered bottle.

On exposure to light ferric ammonium citrate in contact with the organic nature of the paper on which it is spread becomes converted into a ferrous salt. This property is made use of in the "blue" process. See **Cyanotype.**

FERRIC AMMONIUM OXALATE (Formula $Fe_2 (NH_4)_2(C_2 O_4)_4$. Synonyms, *ammonia oxalate of iron*).—Occurs in green very soluble crystals which should be kept in the dark as when exposed to light they become more or less oxidized, which fact is made use of in the "blue" or cyanotype and the platinotype processes. It can be prepared by dissolving 3 ounces of oxalic acid in 8 ounces of water, raise to 212 degrees fahr., and saturated with moist ferric hydrate, avoiding excess. Filter the solution thus obtained and neutralize with ammonia, filter and evaporate to dryness at 100 degs. C.

FERRIC CHLORIDE (Formula, Fe_2Cl_6. Synonym, *Perchloride of Iron*).—Usually purchased in solutions of a reddish-brown color. If it contains free hydrochloric acid its color will be somewhat lighter. Employed in reducing negatives.

FERRIC OXALATE.—(Formula, $Fe_2(C_2O_4)_3$. Synonym, *sesquioxalate of iron*).—Commercial ferric oxalate is usually a solution of the salt in oxalic acid. It can be prepared by adding ammonia to a hot dilute solution of ferric chloride. The precipitated hydrate of iron is then thoroughly washed and drained. Finely powdered oxalic acid is then added in small quantities to the gelatinous mass, vigorously shaking. After a few hours the whole will then be dissolved, and the solution is filtered. As soon as the oxalic acid is added the whole must be protected from the light.

Ferric oxalate is sparingly soluble in water, but freely so in presence of oxalic acid or of potassium or sodium oxalates. Ferric oxalate on exposure to light is converted into ferrous oxalate and on this account is used in the platinotype and certain blue printing processes. Mixed with hypo it is used as a reducer for negative prints, as in contact with silver it is converted into ferrous oxalate, silver oxalate being formed at the same time, which the hypo dissolves.

FERRIC SULPHATE (Formula, $Fe_2(SO_4)_3$. Synonyms, *persulphate of iron, sesquisulphate of iron*).—Obtained by oxidizing ferrous sulphate with nitric acid, and adding sulphuric acid. It is a yellowish-brown deliquescent mass, readily soluble in water, but insoluble in alcohol. It has a slightly solvent action upon metallic silver and it is for this reason employed to clear slightly veiled negatives.

FERRICYANIDE OF POTASSIUM.—See **Potassium Ferricyanide.**

FERROCYANIDE OF POTASSIUM.—See **Potassium Ferrocyanide.**

FERROCYANIDES, TESTS FOR.—Soluble ferrocyanides give, with ferric chloride, a dark blue precipitate, with silver nitrate a really white precipitate and with copper sulphate a brownish red precipitate.

Ferricyanides give with nitrate of silver a dark orange precipitate and with copper sulphate a greenish-yellow one.

FERRO-GELATINE DEVELOPER.—A name given by Carey Lea to one of his old, now unused, collodion developers.

FERRO-PRUSSIATE PROCESS.—See **Cyanotype.**

FERROTYPE.—A name given by Hunt to a process in which collodion positives were made upon thin plates of black or chocolate enamelled iron instead of glass. The results are called "ferrotypes" or "tintypes." Itinerant photographers still employ this method of producing positives direct in the camera, as they are able to supply their customer with the finished print in a few minutes. The process is the same as that employed in the manufacture of collodion positives (*q.v.*), save that the metal plates are used in the place of glass.

FERROTYPE PLATE.—A thin sheet of iron, coated over with a black or chocolate enamel, and used for making positives on, in the ferrotype process.

Ferrotype plates can also be used instead of glass in surfacing or enamelling gelatine prints. See **Enamelling.**

FERROUS AMMONIUM SULPHATE (Formula, $FeSO_4(NH_4)_2 SO_4 CH_2O$. Synonym, *double salt of iron and ammonium*).—Prepared by mixing two parts of ferrous sulphate with one part of ammonium sulphate and dissolving in twice the weight of boiling water previously acidified with a little sulphuric acid. When cool, pale blue-green crystals of the double salt will crystallize out. It is used in place of ferrous sulphate by many on account of its superior stability.

FERROUS CITRO-OXALATE DEVELOPER.—A developer for dry plates introduced by Abney. It is made as follows:

Potassium citrate (neutral)	100 grains
Ferrous oxalate	22 grains
Water	1 ounce

The potassium citrate is first dissolved in a flask by heat, and when nearly boiling the ferrous oxalate is added and shaken up in it, a cork being used to prevent the access of air to it. This amount of ferrous oxalate should just dissolve. It is cooled by allowing cold water to flow over it, and should then have a citrony red color.

FERROUS NITRATE (Formula, $Fe(NO_3)_2$. Synonym, *nitrate of iron*) occurs in brown greenish deliquescent crystals. It is sometimes used in collodion positive ferrotype, or other processes where the positive is viewed by reflection, on account of the white color of the silver deposit.

FERROUS OXALATE (Formula, FeC_2O_4).—A yellow powder obtained by dissolving 2 ounces of ferrous sulphate in 15 ounces of water, acidified with sulphuric acid, and the solution mixed with 396 grains of oxalic acid dissolved in 15 ounces of water. In four or five hours the precipitate of ferrous oxalate will be complete. The liquid is decanted off and the precipitate washed and dried. Ferrous oxalate is practically insoluble in water, but will dissolve to a certain extent in solutions of alkaline oxalates, such as the oxalates of potassium, sodium and ammonium. Oxalate of potassium is the one generally preferred and used in the ferrous oxalate developer, because a saturated solution of it dissolves more of the ferrous salts than any of the other oxalates.

FERROUS OXALATE DEVELOPER.—See under **Developer.**

FERROUS OXALATE INTENSIFIER.—See **Intensfier.**

FERROUS SODIUM OXALATE (Formula, $Fe_2Na_2(C_2O_4)_4$. Synonym, *sodium ferric oxalate*). Prepared in the same manner as ferric ammonium oxalate, except that sodium hydrooxide is used to neutralize the oxalic acid. It is used in the printing-out platinotype process.

FERROUS SULPHATE (Formula, $FeSO_4, 7H_2O$. Molecular weight, 278. Synonyms, *green vitriol* or *copperas, protosulphate of iron*).—Obtained by acting on iron wire or filings with dilute sulphuric acid, evaporating and crystallizing. Pure ferrous sulphate forms bright green crystals. If kept in a perfectly-stoppered bottle it is remarkably permanent. In dry air they effloresce, and in damp air become coated with a brown coating of ferric-sulphate.

Ferrous sulphate is insoluble in alcohol, but soluble in twice its weight of water. In solution it rapidly becomes oxidized, and rendered useless by exposure to the air. If a small crystal of an acid, such as citric or tartaric, be added, it will prevent the fall of the precipitate, though not the oxidation. A solution that has turned quite yellow can be revived by placing in it a small quantity of citric acid and a few pieces of zinc.

Ferrous sulphate is used in the ferrous oxalate developer; it forms double salts with the alkaline sulphates. The double sulphate of iron and ammonium gives a more permanent solution than ferrous sulphate, and is, for this reason, preferred by many as a developer for wet collodion plates.

The rapid deterioration of the ferrous oxalate solution can be avoided if the latter be placed in a bottle. A film of oil rests upon the solution, and entirely protects it from the air. The two tubes are arranged so that the developer may be drawn off without disturbance. By blowing down the tube pointing upwards, the pure developer will be forced out of the opposite tube into the vessel ready to receive it.

FIELD OF THE LENS.—The illuminated space on a screen made by any lens working with full aperture.

FIGURES IN LANDSCAPES.—Nothing adds more to the beauty of a landscape than the introduction of well-selected and properly posed figures. Nothing goes farther to mar the beauty of a landscape than the introduction of badly selected or inartistically posed pictures. Robinson, in his *Pictorial Effect in Photography*, says: "Before placing figures in a landscape the artist should first make up his mind whether the composition requires the introduction of any subject to add to its completeness. If he considers it does, do not let anything induce him to take the view without the figure, because he will be doing something which he can see could be done better with the assistance of a little more trouble; above all he should avoid incongruity, and never, for the sake of pleasing a friend by putting him in the picture, introduce an element of discord. The figures should look so right where they are placed that we should have no suspicion that it would be possible to place them anywhere else. . . . The figures and the landscape should never be quite equal in interest or pictorial value. The one should be subordinate to the other. The pictures should consist of figures with a landscape background (if they are represented in the open air), or of a landscape in which figures are introduced merely for the sake of impressing a point, or adding life to the more important scene."

FILIGRANE.—See **Photo-filigrane.**

FILM.—A thin skin or pellicle of gelatine, collodion, etc., on plates or paper. A film of gelatine or collodion is given to a glass by pouring one of these substances on when in a liquid state, and allowing it to dry. To remove the gelatine films from glass they should be laid in a weak solution of hydrofluoric acid, or they can be removed by rubbing with a paste formed with pumice-stone powder and acetic acid. In order to remove the superfluous film found on the backs of dry plates, they shoud be allowed to dry, and the portions of films removed with a little salt applied with a moistened rag.

FILM NEGATIVE PROCESS, or film photography, is a term applied to processes in which flexible films are used instead of glass plates. As far back as 1855 Scott Archer patented a method of coating collodion negatives with a solution of gutta-percha in benzole. When dry the film was separated from the glass by soaking in water. The glass might also be made to receive a preliminary coating of gutta-percha, the effect of which would be to enclose the collodion film between two waterproof films. The late W. B. Woodbury used during the collodion days a method by which glass was superseded in part. A sheet of glass was first rubbed over with powdered talc, and then coated with a collodion emulsion. After exposure these plates were developed, fixed, and washed, and a sheet of gelatine paper was squeegeed to the finished negative. When dry, the whole could be peeled off the glass, which was again used.

The recent advances in film photography consist in the coating of paper, insoluble gelatine, celluloid, or other flexible material with the sensitive bromide gelatine emulsion. These films are then exposed in the camera, developed, and fixed in the same manner as dry plates. Their principal advantage over glass is, of course, in their lightness, and they have been largely used by tourists and travellers. They have also the advantage of being flexible, unbreakable, and can be packed in a very small space. In the photography of brightly lit objects they are superior to glass, as halation is avoided. Another advantage is that prints can be made from either side with equal facility—a great advantage to the carbon or collotype printer.

The best kind of films are those made upon insoluble gelatine or celluloid. To make the former, clean a large sheet of glass and rub it well with French chalk. A thick solution of gelatine is then poured over it, and the plate placed on a levelling stand to set. When dry the plate is placed in a saturated solultion of chrome alum. This effectually renders the gelatine insoluble. It is then washed, dried, and removed to the dark room to receive the dry-plate emulsion in the manner described under dry-plate. When dry the film is stripped from the glass, and cut up to the required sizes. Instead of chrome alum, the gelatine film may be hardened by soaking with potassium dicromate, exposing to the light, and then well washing; but I believe this method is covered with a patent.

Sensitive films are now made in lengths, and can be used in suitable holders, so that a roll of, say, 25 exposures can be obtained without changing. (See also under **Paper Negative**, **Stripping Films.**)

FILMOGRAPH.—A name given by Humphrey to a camera adapted for the use of films. (See also **Roll-holders.**)

FILTER.—An arrangement through which a liquid is passed to arrest matters mechanically suspended therein. An ordinary filter is made by twisting a piece of filtering paper into proper shape in a funnel. Collodion is usually filtered through tufts of cotton-wool. Gelatine emulsion is filtered through chamois leather, being forced through by pressure. A very simple method of filtering aqueous liquids, which do not deteriorate when exposed to the air, is by drawing them off from one vessel to another by means of a few threads of loosely twisted cotton or worsted arranged to form a syphon. The little twist of cotton at once performs the operations of decantation and filtration. This method will very often be found convenient when it is required to draw water off from a precipitate.

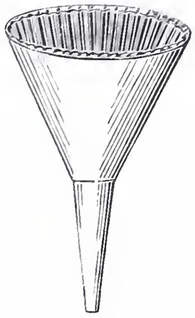


FIG. 184.—FILTERING PAPER ARRANGED IN FUNNEL.

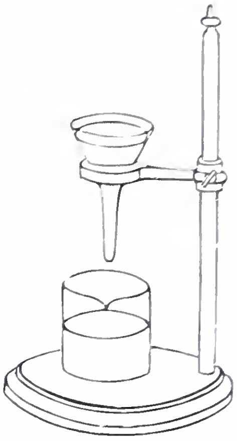


FIG. 185.—FILTER-STAND.

FILTERING PAPER.—A bibulous, unsized paper, thick and woolly in texture, and used for filtering solutions. Swedish filtering paper is thinner, but of superior quality. It is usually cut in round discs. Before placing in the funnel these should be folded several times so that the sides are a number of creases. This will allow of the solution filtering through the sides of the paper, and not at the bottom of the cone only. Good filtering paper should not contain any soluble matter, and when burnt should not give more than $\frac{1}{250}$ to $\frac{1}{260}$ of its weight in ashes. Any soluble matter in the paper can be removed by washing it in hydrochloric acid and afterwards in distilled water.

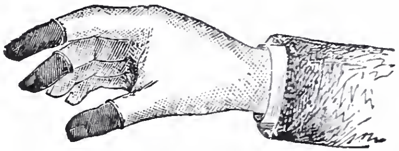


FIG. 186.—FINGER TIPS.

FILTRATE.—Any liquid which has passed through a filter.

FINDER. —See **View Meter.**

FINGER TIPS.—India rubber finger tips are extremely useful little articles, and should always be used when working with acids, process or silver solutions. (See fig. 186).

FIXING.—A term applied to the dissolving away of the sensitive salt unacted upon by light. In the collodion process, potassium cyanide is used as the agent, but in the dry-plate process it is not to be preferred for three reasons—first because it dissolves to a slight extend the finely divided silver that constitutes the image; secondly it has a strong alkaline and softening effect upon the gelatine; and thirdly, it is a most powerful poison.

Sodium thiosulphate, or, as it is more commonly known, sodium hyposulphite, is usually employed. It possesses none of the disadvantages of the potassium cyanide. Its action is to first change the silver bromide into silver hyposulphite, thus :—

$$2AgBr + Na_2S_2O_3 = Ag_2S_2O_3 + 2NaBr$$

and a further quantity of the salt combines with this silver hyposulphite formed to produce a double salt. There are thus two double hyposulphites of silver and sodium, the first $Ag_2S_2O_3Na_2S_2O_3$ is practically insoluble in water, but the second $Ag_2S_2O_3 2Na_2S_2O_3$ is exceedingly soluble. It is for this reason that it is necessary to have a large excess of the sodium salt.

The fixing bath is usually made up by dissolving four or five ounces of hyposulphite in a pint of water. It should be made a day or so previous to using. It will keep for a great length of time, but is liable to become acid. In this case it should be tested, and if required, restored with a few drops of ammonia.

On the introduction of the developed negative in the fixing bath the action of the latter can be easily seen as it dissolves the silver compound. After a few minutes if the back of the negative be examined, it will be observed to have a mottled appearance, or to possess white patches. These are portions of the film where the hypo has not yet done its work. On returning to the solution these parts will eventually disappear. The plate should be allowed to remain a few minutes longer, and then removed.

The addition of alum to the fixing bath is often recommended for simultaneously hardening the negatives and preventing blisters. It is not advisable, however, to mix anything with the hyposulphite bath. Alums and acids decompose it rapidly with precipitation of sulphur and liberation of sulphurous anhydride. If an alum bath is to be used, it should be after fixing and washing.

The strength of the fixing bath for silver prints is about the same as that already given. The prints after toning and washing are laid in it for from ten to fifteen minutes. The action is quicker than with negative films, as the bath can attack both sides at one time. Care should be taken that the prints are not removed before they are thoroughly fixed, otherwise they will rapidly fade.

The difficulty of removing the hyposulphite from films and paper prints is the chief drawback to its use. It can only be done satisfactorily by repeatedly washing in many changes of water.

Other fixing agents have been introduced from time to time. Some years ago the sulpho-cyanides were proposed ; careful trial, however, proved them to be inferior. Dr. Liesegang recommended magnesium chloride, it being an easily obtainable and harmless salt.

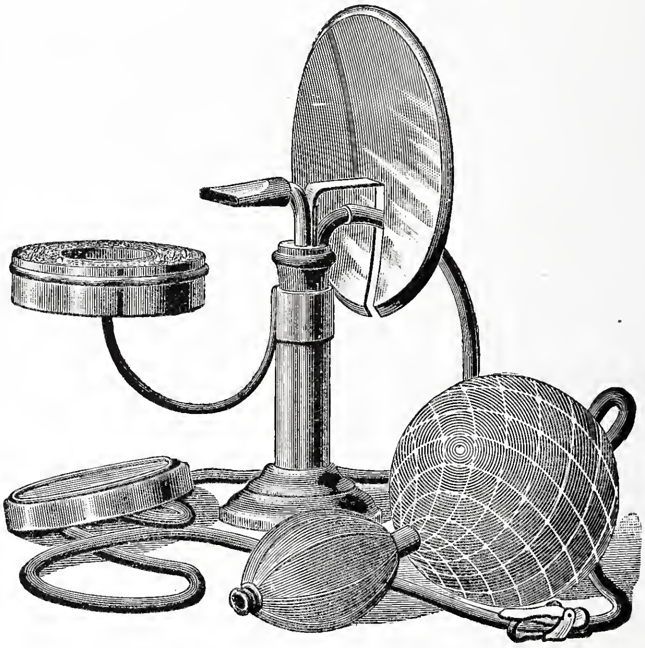


FIG. 187.—FLASHLIGHT APPARATUS.

FLARE.—A defect in a lens, when the image of the aperture of the diaphragm or of the lens itself shows as a circular patch of light on the focusing screen, and in the developed plate as a fogged patch in the centre of the negative. Although this is usually considered to be an image of the diaphragm or lens aperture, Monckhoven, in his work on "Photographic Optics," considers that it is due to the too close adherence to the globular form in the construction of the lens.

If this defect makes its appearance, the diaphragm apertures should be painted with a dead black varnish, as it is sometimes due to the edges having been worn bright. The Iris diaphragm is particularly liable to this defect by reason of the friction of the tongues of metal forming the apertures.

FLASHLIGHT.—Usually made by blowing magnesium powder through a small flame. This produces a flash of bright light sufficiently actinic for the purpose of making portraits or groups. In the purchase of the magnesium powder care should be taken that it does not contain a large portion of zinc, as many of the cheaper kinds do. It should be carefully stored in tightly-fitting tins or stoppered bottles, otherwise it will be rendered useless by absorbing moisture from the air. There has been recently a number of different patents and inventions for flashlight apparatus. All that is really required is an arrangement similiar to that depicted in figs. 187 and 188, by which a spray of the magnesium or flash powder can be ejected through a gas flame, and if the gas bracket be fitted with universal joints it will be possible to throw the light from any desired angle. If improperly managed, flashlight photographs present a very ghastly black and white appearance. We have to remember that the conditions under which we are working with flashlights are very different from those made by daylight. In the latter the light is diffused throughout the room, while with the flash lamp it is concentrated to what may almost be termed a point. The effect of this is not difficult to imagine—high lights and dark shadows and absence of detail in both. All defects in the skin are magnified a hundredfold, the slightest personal defect being exaggerated to an unpleasant degree. To avoid this it will be necessary for the artist to carefully study the position of the light, and the distribution of it over the sitter by reflecting screens and contrivances. If properly and judiciously managed, this power to concentrate, diffuse and distribute the light at will is one of the chief advantages, and, if carefully carried out, some very striking effects may be produced.

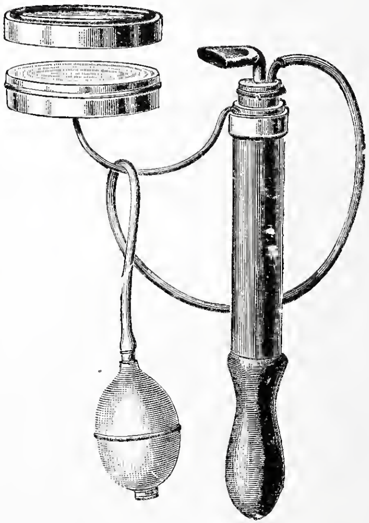


FIG. 188.—FLASHLIGHT APPARATUS.

Besides the production of portraits at night time, the flashlight has been put to other very useful purposes. For making photographs of interiors its utility cannot be over estimated. In science it has been used for photographing the interior of tunnels, coal mines, caves, etc. The oculist has found it useful in photographing the retina of the eye. When in perfect darkness the pupil of the eye is dilated to its utmost, and a flashlight photograph can be made of it so rapidly that it has no time to contract, and so an image is made of it as it cannot possibly be seen by the eye. In developing flashlight negatives use as little pyro or eikonogen as possible, so that the detail will have time to appear. When this occurs apply the full strength of the developer.

FLASHLIGHT POWDER.—A powder usually made with powdered magnesium, chlorate of potash, picric acid, and potassium dichromate, and used in flashlight photography. The manufacture and use of these powders is not unattended by extreme danger, many accidents and loss of life have already taken place. For all ordinary purposes the pure magnesium powder may be used. The addition of a small quantity of ammonio-chlorate of copper will give a blue flashlight.

FIG. 189—FLASK.

FLASK.—A glass vessel for holding liquids. It is usually made of iron-glass so that heat can be applied without fear of breakage.

FLATNESS.—A term used in photography to denote a lack of vigor or contrast in the negative or in the positive. The effect is usually due to over-exposure, or to over-development.

FLATNESS OF FIELD.—A lens is said to give great or less flatness of field, according to its power of defining objects in the centre and at the margin of the image. The image formed by a double convex lens is, as will be seen on reference to Fig. 190, of a concave form. The retina of the eye, upon which the image is thrown, is of a concave form, hence we see all things straight. In the camera, however, we employ a plane screen. The effect of this is that if we focus the centre of the image on the ground glass, the sharpness of the outer portions is destroyed, and if we bring the latter into focus the centre becomes indistinct.

In making compound lenses the principal object aimed at is to bring the light rays as near as possible to a focus on a plane. Theoretically this is impossible, but opticians have made very wonderful strides of late years in this direction, and many lenses are now made possessing great flatness of field.

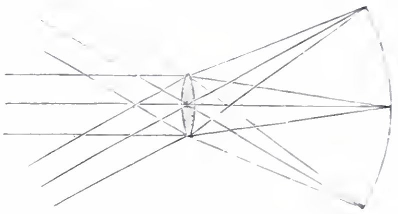


FIG. 190

FLEXIBLE SUPPORT.—An improvement in the carbon process, patented by J. R. R. Sawyer in 1874. See **Carbon Process.**

FLINT GLASS.—A species of glass usually composed of white sand, potassium carbonate, lead oxide, alumina, with metallic addition to neutralize the color. The flint glass of Guinand (one of the first optical glass makers) is composed of

White silicious sand,	37·5
Red oxide of lead	37·5
Potash (best)	8·5
Borax	·15
Nitre	·18
Manganese	·17
Arsenious acids	16
Waste pieces of previous meltings	100

The silica for the manufacture of flint glass was formerly manufactured from pulverized flints, hence the name.

Flint glass is largely used in the manufacture of photographic lenses. See **Glass.**

FLOUR PASTE.—See **Mountant.**

FLUID LENS.—A lens containing water was patented by Thos. Sutton in 1859. The patent rights were afterwards bought by Ross, and since then other fluid lenses have been constructed. Sutton's lens was an achromatic panoramic (see Fig. 191), with which, owing to its spherical form, the oblique rays were transmitted almost as perfectly as the central ones.

Fluid lenses have never become popular, owing to the chance of leakage, and also to the impossibility of keeping the temperature of the liquid perfectly equal, which was necessary, as a change in the temperature means also a change in the refractive power of the lens.

FLUORESCËIN (Formula, $C_6H_4[COC_6H_3(OH)_2]_2$).—A yellowish-red powder freely soluble in alcohol, slightly in water, giving a green fluorescent solution. The bromo and iodo derivatives—eosin and erythrosin—are employed in the orthochromatic process.

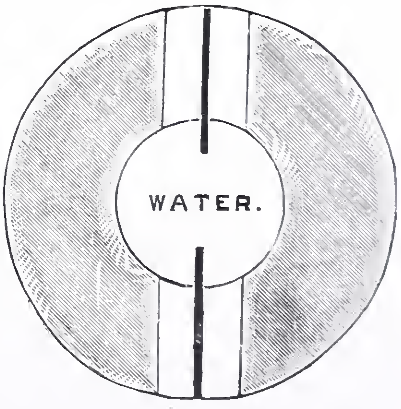


FIG. 191.

FLUORESCENCE.—In optics, a quality which exists in rays of light by which, under certain circumstances, they undergo a change of refrangibility. Certain solutions, if viewed by transmitted light, are colorless, but become of a bluish tint if viewed by reflected light.

FLUORHYDRIC ACID.—See **Hydrofluoric Acid.**

FLUORINE (Symbol, F; atomic weight, 191).—A non-metallic element, only recently obtained in a free state. It is an isometric, transparent mineral usually obtained from fluor spar.

FOCAL LENGTH.—See **Focus.**

FOCIMETER.—An instrument used in testing for chemical focus. (See Fig. 105).

FOCUS.—A term used in optics.

Principal Focus.—If a pencil of parallel rays enter a convergent lens, they will be brought together at a point F (Fig. 192) on the other side of the lens. This point is termed the *principal focal point*, and its distance from the lens is termed the *focal length.* Those rays which pursue a parallel course before they enter the lens are condensed to a point nearer the lens than diverging rays. The rays of light proceeding from very distant objects are parallel, while those from near objects diverge. When the rays diverge from a point, that point is associated with the focus, and the two are termed conjugate foci. The distance between the lens and the object is the anterior or major conjugate, and that existing between the lens and the ground glass the posterior or minor conjugate focus. In Fig. 193 F is the principal focus, and A and B are the conjugate foci. If an object be placed at A it will have its focus at B, and conversely if placed at B, its focus will be at A. It will therefore be seen that the principal focus of the lens never varies, but the length of focus for objects near at hand becomes greater the nearer they are brought to the lens. The relation of the conjugate foci is governed by certain laws. On page 135 will be found a table of conjugate foci, which should be carefully studied.

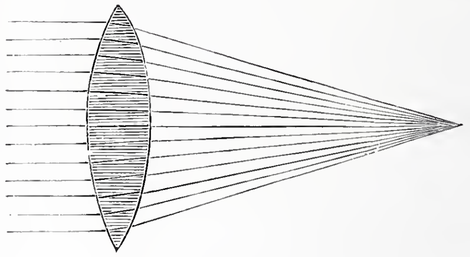


FIG. 192.

In dispersing lenses the focus is termed negative and is situated at a point where the rays meet (see Fig. 194).

Actinic Focus.—Under the heading **Aberration** will be found some remarks concerning chromatic aberration, by which it will be seen that unless the lens be rendered achromatic the actinic or chemical focus does not coincide with the visual focus. To make this clearer we have in Fig. 195 the focus of a non-achromatic lens. Its visual focus is at V, while its chemical focus is at C. The ground glass of the camera would be placed at V. and the image focused to the eye, but the chemical focus being at C it would be necessary to push it to that point, in order to get a sharp negative. Most modern lenses are, however, achromatized. The method by which this is performed is explained in *Chromatic Aberration* under **Aberration.**

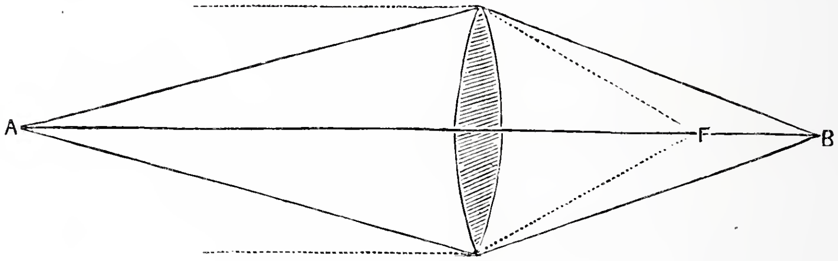


FIG. 193.

Depth of Focus of a lens is its power of rendering a sharp image upon the plane ground glass screen of objects situated at varying distances. A lens working at full aperture rarely renders near and remote objects perfectly clear at the same time. By using a diaphragm a portion of the rays is cut off, and a much greater depth of focus is obtained, but with the sacrifice of illumination, necessitating increased exposure. (See also **Diaphragm.**)

Equivalent Focus.—A term applied to a compound or doublet lens. It is the focus or parallel rays entering the lens, and is termed equivalent from being compared with a single lens producing the same size image when placed at the same distance from the object. To be perfectly correct, the point from which this focus should be measured is situated between the diaphragm slot and the back combination. It is, however, usually measured from the slot itself, and this measurement will usually be found sufficiently accurate if an object over 150 yards away be focused on the ground glass and the distance between the diaphragm slot and the screen be measured.

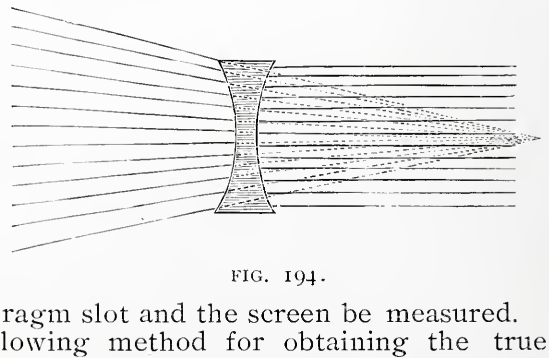


FIG. 194.

Grubb, the well-known optician, gives the following method for obtaining the true equivalent focus of a lens:—"Set the camera before a window upon a flat table, upon which is

THE PHOTOGRAPHIC TIMES.

AN ILLUSTRATED MONTHLY MAGAZINE DEVOTED TO THE ART, SCIENCE AND ADVANCEMENT OF PHOTOGRAPHY.

Issued on the fifteenth of each month.

EDITED BY WALTER E. WOODBURY, F. R. P. S.

SUBSCRIPTION RATES.

For one year, - - - -	$4 00	Three months' trial, - - -	$1 00
For six months, - - - -	2 00	Single copy, - - - -	35

On Foreign Subscriptions, $1.00 is added to pay postage.

Remit by Express Money Order, Draft, P. O. Order, or Registered Letter.

Subscriptions to The Photographic Times received by all dealers in photographic materials in this and foreign countries, also by The American News Co. and all its branches.

ADVERTISING RATES WILL BE SENT ON APPLICATION.

Copy for advertisements must be received at office one week in advance of the day of publication. Advertisers receive a copy of the journal free, to certify the correctness of the insertion.

All literary contributions, correspondence, "Queries," etc., should be addressed to The Editor; all advertising matter to the Publishers.

THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION,
60 and 62 East 11th Street, New York.

Businesses For Sale.

Advertisements will be inserted in this column at the rate of 25 cents per line of ten words. Display lines will be charged double. No advertisement will be inserted for less than one dollar. Cash must in every case accompany copy, which should reach us not later than the tenth of each month.

FOR SALE.—An established Photo View business, well equipped, and nearly a thousand choice negatives, all good sellers. A good business, from $200 to $500 a month, for $1000 cash. We have the most healthy and pleasant climate in the United States. Address, C. B. WAITE, 254 So. Broadway, Los Angeles, Cal.

FOR SALE—Finest located Photograph Gallery in Washington, D. C.; nicely equipped; fine electric photograph system (patented); rare chance for man to make a national reputation; low price; easy terms. Owner has large patent interests and must sell. Address, CLINEDINST, 907 Pennsylvania Avenue, Washington, D. C.

FOR RENT.—A first-class gallery in a country seat town of about 2,500 population in which there is only one gallery. Rooms in new brick building just completed; built for the purpose and the best in Northwest Mo. None but first-class artists need apply. Address,
GEO. L. OWENS, Bethany, Mo.

FOR SALE, or partner with half interest in one of the largest, best equipped, and most central galleries in Philadelphia. A chance for the right man. Address "Cosmos," care of The Photographic Times office, 60 and 62 East Eleventh street, New York City.

FOR SALE.—A nice, neat gallery, well furnished and equipped, in good location, on Broadway, Brooklyn. A decided bargain to cash purchaser.
GOVAN, 5 Clinton Place, New York City.

FOR SALE, with or without Lenses. $2,500 business a year. Close to good mining country.
Address "PHOTOGRAPHER,"
305 Commercial Street, Trinidad, Col.

SPECIAL BUSINESS OPPORTUNITY.—A competent wood and metal engraver or artist can buy paying interest in an Incorporated Company, doing engraving by all methods, in prosperous Ohio city. Opens position as Superintendent and officer of Company. A rare opportunity to come in with splendid business.
Address at once for full particulars,
"SECRETARY TREASURER,"
this office.

Sale and Exchange.

Advertisements will be inserted in this colume at the rate of 25 cents per line of ten words. Display lines will be charged double price. Advertisements will not be inserted for less than one dollar. Cash must in every case accompany copy, which should reach us not later than the tenth of each month.

FOR SALE.—A 4 x 5 Henry Clay Camera, complete, with tripod and three extra plate holders. Cost $60, will accept $35. Address Editor Photographic Times, 60 and 62 East Eleventh Street, New York City.

FOR SALE.—About 2,000 Stereoscopic negatives of South America, Africa, India, China, Japan, Siam, Straits Settlements, Philipine Islands, and N. S.
Replics not noticed unless accompanied by definite offer. Address "A. C. L." office of this paper.

FOR SALE OR TRADE.—$100 Bicycle, for good Portrait Lens of equal value, or for Job Printing Press. Address, Box 113, Pocahontas, Ill.

Employment.

Advertisements of Operators Seeking Situations will be Inserted Free of Charge.

Employment Wanted.

As operator and retoucher; good all-'round man; steady and sober; 30 years' experience. Box 333, Deposit N. Y.

Examine the New Reifschneider Album "The Regent."

Reliable young man desires steady position in a good gallery; willing to start low with a promise of advancement; a good printer and toner; has done some retouching; reference and samples. Address, J. W. Cramer, No. 95 Delafield St., Poughkeepsie.

A1 operator and retoucher, competent to take charge of gallery, is open for engagement. Address, "R. L. Store," 929 Columbus Ave., New York City.

Position as operator and retoucher; best of New York and Baltimore references. Address, Walter Moffatt, care of The Photographic Times.

Situation wanted by a young man as printer; city or country; 5 years' experience; can give first-class references. E. Hallen, 224 E. 33d St.

Wanted —Situation by a lady of several months' experience. Can assist in all branches. Am willing to work for board for awhile. Address Miss Ida Sutton, Janesville, Ia.

A first-class operator and retoucher is open for engagement; capable of managing studio; can also work up crayon portraits. Wages reasonable if position is steady. Address "Photographer, 624 First Street, Lancaster, Pa."

Wanted.—Situation as general workman, finisher or retoucher. Will take work here, from away. Reference, and samples given. Address Lock-box, 294, Estherville, Ia.

VIEW OPERATOR wants permanent position with responsible parties. Am thoroughly familiar with railroad and panoramic work, bromide enlargements, lantern slides, window transparencies, and will guarantee to equal in quality any other work made. I except none. Coloring views a specialty. Satisfactory reference given. Address GEO. E. MELLEN,
240 N. State Street, Chicago, Ill.

Young man wants position as a printer and toner, or dark room man, can also operate and copy. Has references from first-class galleries in New York City and Brooklyn. Moderate salary. Address W. P. Leverich, 182 Bergen Street, Brooklyn, N. Y.

Employment Offered.

Photographer for out-door work; must be able to solicit orders. We pay good wages and expenses, and furnish team, instruments, and assistant. Wilson Art Studio, Port Jefferson, L. I.

H. B. PUTERBAUGH, PHOTOGRAPHER AND PROCESS ENGRAVER.

John Carbutt, Esq., Wayne Junction, Pa.

Dear Sir: Sample of your "New Process Plate" at hand and tested with the MOST PLEASING RESULTS. I send herewith a small order for Strippers, and if I have as good success as I had with my first trial, I shall discard the wet plate process FOREVER, for I am disgusted with it.

Very respectfully,
(Signed) H. B. PUTERBAUGH.

RETOUCHING FOR THE TRADE—First class work at moderate prices. Address Miss ALICE WINSLOW, 1,129 N. Main street, Brockton, Mass.

LANTERN SLIDES.—If you require good ones from your negatives send to
H. H. WILLIAMS, Simcon, Va.

35 CENTS

Buys 1 ounce of **CONDENSED LIGHT** a **powerful, quick, safe** and **cheap** flash light powder. Sample free. If your dealer can't supply it send to **Jas. H. Smith & Co.**, Manufacturers, 311 Wabash Ave., Chicago.

SPECIAL NOTICE.

BACKGROUNDS
FOR CARBON AND PLATINUM EFFECTS.

W. F. ASHE, Scenic Artist,

76 East 9th Street, - - New York City.

Amateur Photographers

say that **the Best Blue Print Paper** is our

FRENCH SATIN JUNIOR.
4x5 per gross, $1.00
5x8 per gross, $2.00

Does all that silver paper will. Unsurpassed for beautiful definition. Keeping qualities guaranteed for one year. Money returned if not satisfaetory. **New Book on Blue Printing, Sample and Price List FREE.**

J. C. MILLEN, 921 Arch Street, PHILADELPHIA, PA.

NOW READY.

Bargain List No. 46, full of BIG BARGAINS. Call, or send your address, and receive it with "POCKET PRICE LIST," containing everything photographic. Developing and finishing photographs. Cameras, Lenses, etc., bought, sold or exchanged.

R. H. MORAN, 22 East 16th Street, N. Y.

M. C. PURSELL & E. W. PURSELL,

High-class Carbon Prints and enlargements in all colors on Paper, Porcelain, Ivory, Celluloid and Canvas. Transparencies.

No. 45 EAST 20th STREET
NEW YORK CITY, N. Y.

Use "Non-Cockle" Mounting Paste.

Money-Making Photographer.—Town, situated on a river; inhabitants, all kinds, rich and poor; it was a good village as far as business was concerned, although the people did not all go to one church.

Four photographers did business there: Jones had been there 26 years and Brown 6, the other two we did not enquire about. Jones was mighty envious of Brown, and told everybody "that young upstart thinks he's really nice; he is always trying to be so attentive," and etc. Brown, however, went on with his business, turned out fair work and tried to please his customers. Soon he bought a little home, got a good long lease for his gallery: got the work from the high school the last three seasons; in short he was making money, and all this troubled Jones.

One day they met at the express office, and Jones, who had by this time accumulated so much curiosity, spoke up: "See here, Brown, how in the dickens do you make enough money to buy a house and lot, live the way you do? Here I have been pegging away for 26 years, and still pay rent, and were it not for our girls we would not live at all these times." To which Brown replied, "I don't know how you manage, but I have made a few points my duty, and if they will do you any service, I will tell you. When I came here I had saved $250.00, leased the gallery, put in my outfit and went to work, put a few lines in the paper, and my first customer came. How well I remember her. A dear old lady, but she knew nothing of pictures. I waited on her most patiently, overlooked all her whims, and finally pleased her. But here, I am making this a yarn, not points. Jones, it's simply this: attend to your own business; always be ready to wait upon people; when a few prints are bad, make them over. Get good goods, and from a stock house that sends what you order. Don't let some fellow fill you up for three months to come, deal with a house that sends their orders out promptly, keeps the best chemicals; in short get good goods quickly, and show a little enterprise, and you know there is still enough margin in the picture business to make a good living."

"Is that the way you did it, Brown?" "Yes, that's all." "Well, where do you get your stock, anyhow?" "Of Thumb Bros. & Schmidt, Grand Rapids. They send me what I order and send it promptly; prices are always right to the penny; what's more, they appreciate their customers. Try them and see."

Photographic Everything

NEW STORE—Convenient
NEW STOCK—Complete
NEW PRICES—Lowest
NEW IDEAS from everywhere
NEW APPARATUS of all makers
NEW SUPPLIES of old staples

The Scovill & Adams Co. of New York

Nos. 60 and 62 East 11th St.
(Five doors from B'way)

Send 35 cents for a sample number of The Photographic Times, containing about 100 handsome photographic illustrations.

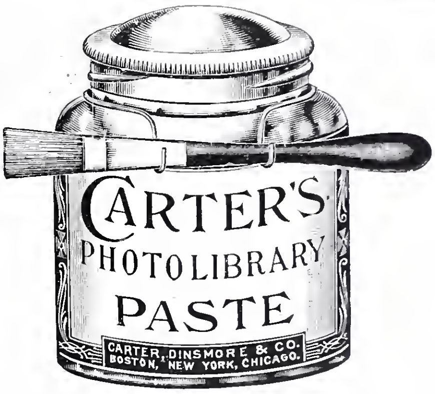
BOUND VOLUMES
OF
VOL. XXVIII, THE PHOTOGRAPHIC TIMES
CONTAINING THE ISSUES FOR JAN. TO DEC. 1896
CAN BE OBTAINED.
PRICE FIVE DOLLARS,
FROM
THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION,
60 and 62 East 11th St., N. Y.

THE ALBERTYPE COMPANY
PHOTO GELATINE PRINTERS
15 LAIGHT ST., NEW YORK.

VIEWS MADE INTO SOUVENIRS

at short notice, from photographs or negatives.

SEND FOR SAMPLES AND EDITION PRICES.



No. 153, 7 oz. Jar.

The latest advanced chemical research in the department of adhesives is embodied in

Carter's Photo-library Paste,

which is specially adapted to delicate and important Photographic and Library work, such as Mounting, Photographs and Engravings, Labeling Books and Magazines, Attaching Clippings to Scrap-books, etc. The Paste is smooth, uniform, and powerfully adhesive. It does not cockle paper or injure in any way objects to which it is applied, It is delightfully perfumed, put up in attractive and convenient packages, and always ready for use.

Send for Sample and Descriptive Circular.

CARTER INK CO.,
Boston, New York, Chicago.

CHAS. R. STEVENS, Pres't and Treas.
GEO. P. MACKIN, Vice-Pres't and Sec'y.

CHICAGO PHOTO STOCK CO.,
Dealers in
Standard Photographic Apparatus and Supplies,
38 E. Randolph St., Chicago, Ill.

Reifschneider's Eclipse Albums are the Best.

BARGAINS

in all kinds of

**Photographic Goods,
Lenses, Cameras, Stands,
Burnishers, Backgrounds, etc.**

Send for No. 7 Bargain List, or tell us what you want.

BARGAIN List (No. 9), 32 pages will be ready the latter part of April 1897. If you do not receive it by May 1st 1897 apply for copy. Any New Goods supplied at lowest Market Price.

Biggest Photographic Bargain House in the World.

RALPH J. GOLSEN, 146 State St., CHICAGO.

PHOTOGRAPHERS! Professional or Amateur, Send for Catalogue, "New and Useful Specialties," Just Out. **FREE**

O. H. Peck, 215-219 Sec. Av. S. Minneapolis, Minn.

Cameras and Cash

We've got the Cameras and want the cash. Photo supplies of all sorts and of all makers

Complete Photographic Library (56 instruction books covering the entire field of photography.) New Store—convenient. :: :: :: :: :: ::

Prices that render the goods **Prizes**

The Scovill & Adams Co. of New York
Nos. 60 and 62 East 11th St.
(Five doors from B'way)

Send 35 cents for a sample number of The Photographic Times containing about 100 handsome photographic illustrations.

PORTABLE ART STUDIOS.

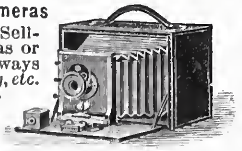
Light, Substantial, Practical Business Buildings. Cash or on time- **ALL WOOD!**

Send Stamp for Catalogue. W. D. PUGH,

PORTABLE HOUSE CO., Grand Rapids, Mich.

N. Y. CAMERA EXCHANGE

60% Saved on all makes of Cameras



Headquarters for Buying, Selling, and Exchanging Cameras or Lenses. Large assortment always on hand. *Developing, printing, etc.*

Photo supplies of every description at *lowest prices.*

☞ *Send 2c. stamp for bargain list.* Address

N. Y. CAMERA EXCHANGE, 41 Fulton St., NEW YORK.

New Things Photographic

all come to our store. Some sell slowly, others quickly, but visitors can here see everything old and new and buy at lowest market prices for cash.

The Scovill & Adams Co. of New York
Nos. 60 and 62 East 11th St.
(Five doors from B'way)

Send 35 cents for a sample number of The Photographic Times, containing about 100 handsome photographic illustrations.

FOR

C. P. NITRATE SILVER

IN CRYSTALS OR FUSED, AND

C. P. CHLORIDE GOLD

WRITE TO THE MANUFACTURER

ROBERT F. MAIER, 326-332 South St.,

NEWARK, N. J., U. S. A.

KING OF
FLASH LIGHT POWDERS.
LUXO
PATENTED.
FOR SALE BY ALL DEALERS
W. P. BUCHANAN. PHILADELPHIA.

W. HEUERMANN,
IMPORTER OF
TRAPP & MUNCH'S
T. M. BRAND.
ALBUMEN PAPER, SALTED PAPER,
No. 23 CEDAR STREET, New York.

THE AMERICAN PHOTOGRAPHIC PAPER CO.,

MANUFACTURERS OF UNPREPARED *Photographic Papers*

SPECIALTIES;

Raw Paper for Solar Printing, Platinotype, Bromide, Salting, Baryta Coating, rough or smooth surface, in rolls or sheets. Also high grade Drawing Paper for Architects, Buff and White, in rolls or sheets.

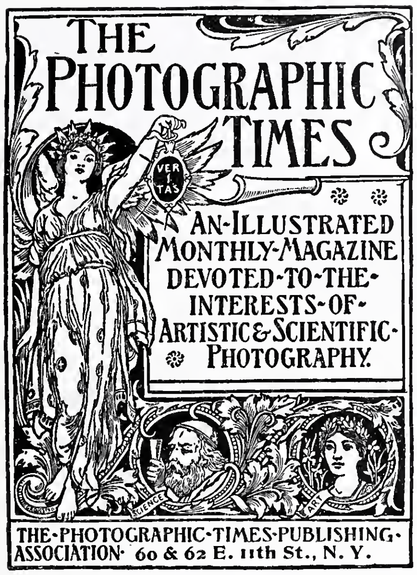
MANUFACTURED AT MILLS OF

HURLBUT PAPER MANUFACTURING CO., SOUTH LEE, MASS, U.S.A.

OFFICES:

2304 Washington St., Boston, Mass., U.S.A.

Have You Tried "Three Shields" Plates.


THE PHOTOGRAPHIC TIMES
AN·ILLUSTRATED MONTHLY·MAGAZINE DEVOTED·TO·THE· INTERESTS·OF· ARTISTIC & SCIENTIFIC· PHOTOGRAPHY.
VER I TAS
SCIENCE
ART
THE·PHOTOGRAPHIC·TIMES·PUBLISHING· ASSOCIATION· 60 & 62 E. 11th St., N. Y.

EDITED BY WALTER E. WOODBURY, F. R. P. S.

NOW...

is the time
to subscribe.

THIS ISSUE COMMENCES
A NEW VOLUME . . . .

◆

Subscription Rates:

One Year,	$4.00
Six Months,	2.00
Three Months,	1.00
Single Copies,	35 cents

◆

Fill in the enclosed and send it to us at once:

Subscription Form.

THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION,
60 and 62 East 11th Street, New York,

Gentlemen: Please send THE PHOTOGRAPHIC TIMES for .... year, commencing .... 189 , for which I enclose .... dollars.

Name ....

Address ....

....

The Leading Photographic Magazine of the World.

TERMS CASH.—To avoid all risks, we prefer remittances by Express, Money Orders, Draft on New York, Post Office Money Orders, Postal Notes, or Registered Letter.

NOW READY

"Photographic · · · · Amusements"

By WALTER E. WOODBURY,
Editor of "The Photographic Times."
and "The American Annual of Photography.'

Containing a Description of

A Number of Photographic Experiments and Novel Effects to be obtained with the Camera.

Invaluable to both the Amateur and Professional Photographer.

CONTENTS.

The Mirror and the Camera.
The Photo-Anamorphosis.
Statuette Portraits.
Magic Photographs.
Spirit Photography.
Photography for Household Decoration.
Leaf Prints.
To Make a Pen and Ink Sketch from a Photograph.
Photographs on Silk.
Photographs on Various Fabrics.
Photographs in any Color.
How to Copy Drawings.
Dry-Plates that Will Develop with Water.
Photographing the Invisible.
How to Make Photographs in a Bottle.
Caricature Photographs.
Photographing a Catastrophe.
Sympathetic Photographs.
Wide-Angle Studies.
Silhouettes.
Freak Pictures with a Black Background.
Freak Pictures by Successive Exposures.
Photographing Snow and Ice Crystals.
Photographing Ink Crystals.
Photographing Sea Weed.
Stamp Portraits.
Moonlight Pictures.
Floral Photography.
A Simple Method of Enlarging.
Distorted Images.
Luminous Photographs.
Photographs Without Light.
Electric Photographs.
Pinhole Photography.
Magic Vignettes.
Instantaneous Photography.
Photographing Fireworks.
Lightning Pictures.
The Photochromoscope.
Composite Photography.
Double Exposure Pictures.
Tele-photographs.
Artificial Mirages.
Etc., etc., etc.

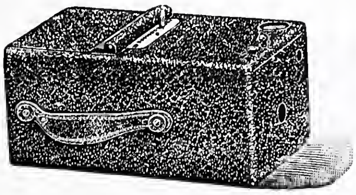
OVER ONE HUNDRED ILLUSTRATIONS.

Price, in Paper Covers, $1.00. Cloth, $1.50.

Sent post-paid on receipt of price by the Publishers,

THE SCOVILL & ADAMS COMPANY OF NEW YORK,
60 and 62 East Eleventh St., New York, N. Y.

SEND FOR NEW CATALOGUE OF PHOTOGRAPHIC PUBLICATIONS.



Size, 9½ x 5½ x 4½ in.

REX.

THE REX MAGAZINE CAMERA is the most complete, practical magazine camera on the market. Holds twelve 3¼ x 4¼ dry plates, any of which can be exposed without interfering with the other plates

TAKEN WITH THE REX.

THE REX IS . . .

EASY OF MANIPULATION. . . .

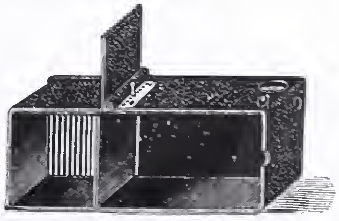
SIMPLE IN CONSTRUCTION. . .

ATTRACTIVE IN FINISH. . . . .

Write for Descriptive Catalogue. PRICE OF REX, $9.00.

Rex Magazine Camera Company,
13 and 15 West 28th Street,
NEW YORK CITY.

Factory, 89 East Third St., St. Paul, Minn.



WORKS OF THE HAMMER DRY PLATE CO.

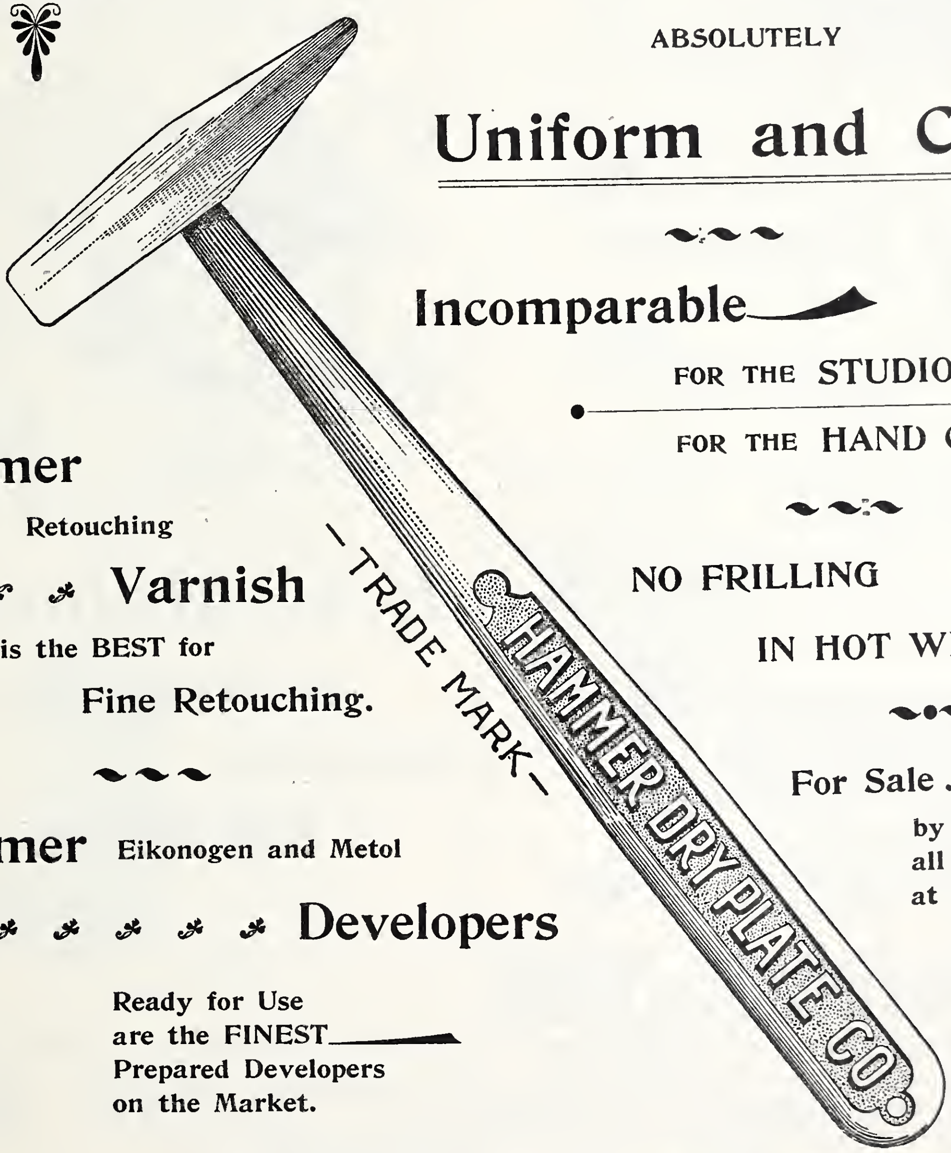
(See opposite page.)

Use the Hammer = =

Dry Plates

ABSOLUTELY

Uniform and Clean.



Incomparable

FOR THE STUDIO,

FOR THE HAND CAMERA.

NO FRILLING

IN HOT WEATHER.

For Sale ....
by
all Dealers
at
Popular
Prices.

Hammer
Retouching
Varnish
is the BEST for
Fine Retouching.

Hammer Eikonogen and Metol
Developers
Ready for Use
are the FINEST
Prepared Developers
on the Market.

Send for Hammer's "Little Book" a short talk on negative making, mailed free to any address.

MANUFACTURED BY

Hammer Dry Plate Co.,

ST. LOUIS, MO.

THE SCOVILL & ADAMS CO. OF N. Y., EASTERN TRADE AGENTS.

MINOTT M. GOVAN,
DEALER IN PHOTOGRAPHIC SUPPLIES,
No. 5 Clinton Place, New York.
(Three doors from Broadway.)

FULLY ILLUSTRATED Catalogue and Price List mailed on application. Lenses and Outfits a specialty.

DIETZ RUBY LAMP

For Dark-Room Use.

New Construction
Don't Leak Light.
1½x3x6½ ins.
NO SMOKE.

Sold by Dealers.
We send you one, prepaid, for
75 CENTS.
Circular free.

R. E. DIETZ CO., N. Y.

"Modern and Progressive." STEPHEN B. BUTTS.
JOHN F. ADAMS.

BUTTS & ADAMS,

TRADE B & A MARK

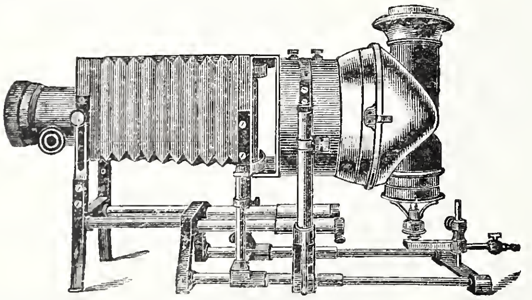
Photographic Supplies,

457 and 459 Washington Street,
BUFFALO, N. Y.

HEADQUARTERS

For PORTRAIT ENLARGEMENTS in Crayon, Pastel Water Color, India Ink; also Argentic Enlargements for Photographers.

Large Establishment. Superior Equipments.
First-class Artists.
N. L. STONE & SON,
56, 58 & 60 Market Street, Potsdam, N. Y.



Criterion Projection Lantern

WITH WELSBACH GAS BURNER.

Oil, Lime, Welsbach Gas, Incandescent Electric or Arc Electric Light may be used interchangeably with our make of

Magic Lanterns and Stereopticons.

The view front of lantern is interchangeable with various

SCIENTIFIC ATTACHMENTS.

Send for Illustrated Catalogue.

"How to Make and Color Lantern Slides."

By D. L. ELMENDORF.

A new book of instructions; the most complete and comprehensive work on the subject published.

PRICE (Postpaid), - ONE DOLLAR.

J. B. COLT & CO., 115-117 Nassau St., New York.
UPTOWN BRANCH, 59 FIFTH AVENUE.

SAVE YOUR MONEY!!!

How?

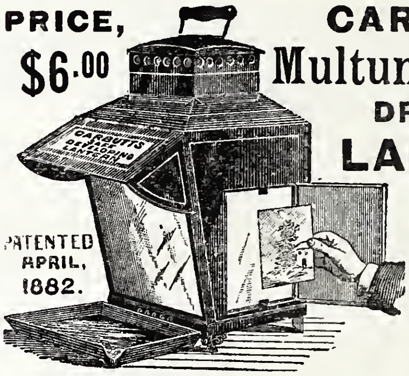
Why by saving all your washings from **Albumen** and **Aristo Papers**; they can be saved **together** in **same barrel.**

Put all your Clippings **together** and send them to

EMIL SCHNEIDER,

Refining of Photographic Wastes A SPECIALTY.
11 & 13 N. J. R. R. Place,
Write for Information and Shipping Tags. NEWARK, N. J.

PRICE, $6.00



PATENTED APRIL, 1882.

CARBUTT'S Multum-in-Parvo DRY PLATE LANTERN.

The **Best** and **Cheapest** for all Dark-Room Work.

Manufactured by
JOHN CARBUTT
Wayne Junction,
Philadelphia.

Lantern arranged for developing, and, after fixing, examining negatives and positives by opal light.

E. C. Meinecke

158 Worcester St., N. Y.

PHOTOGRAVURE
PLATE MAKER AND
PLATE PRINTER

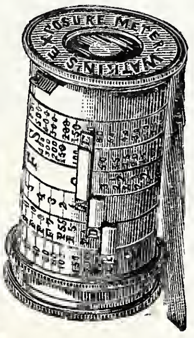
The very best skill to be obtained, combined, with the constant addition of improved facilities, will insure you quality.

Your Busines is Solicited

Samples and Prices on Application.

Carter's Photo Library Paste will be found a boon to all photographers. It is put up in neat glass jars, and goes out with the guarantee of these well-known manufacturers. It may be purchased through the Scovill & Adams Co. of N. Y., or any photographic merchant.

AVOID FAILURES IN MAKING NEGATIVES BY USING THE WATKINS EXPOSURE METERS.



THE NEW STANDARD (1895.) $5.00.

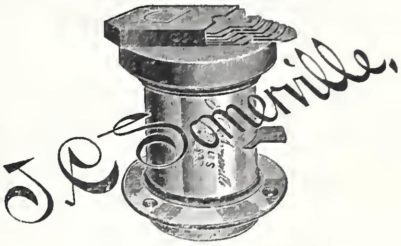
SIMPLER than the old standard, having one less pointer. Provided with the subject and enlarging scales, which do not obtrude themselves when not wanted. The only instrument made which is *absolutely complete* for all problems, especially copying, enlarging and contact printing without reference to tables. It supersedes the old enlarging pattern at a smaller cost. The best all round instrument, as for ordinary work it is quite as simple in use as the Watch or Junior patterns, though not made so light or convenient in shape; quite a feather-weight when made in aluminum. Provided with a pendulum, which is invaluable for timing the actinometer and camera exposures. Exposures under one second are now marked in vulgar fractions, on a distinct part of the scale to the seconds scale.

INSTRUCTIONS (for all ordinary subjects).—*Set pointer P to plate speed, D to the diaphragm, A to the light value, and E will indicate the exposure.*

For Sale by THE SCOVILL & ADAMS CO. OF N. Y., 60 & 62 E. 11th St.

---

411 and 413 Washington Avenue,

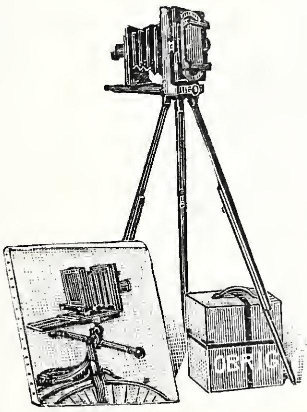


ST. LOUIS, MO.

Send for Our Lens Pamphlet and Bargain List.

OUR FACILITIES

Were NEVER BETTER



For turning out good printing than they are at present. We are known for our good, even and careful work in this respect. With the word "**Printing**" we mean to cover not only **Albumen** and **Aristo** contact work, but **Platinotype** and **Blue Prints** as well. Bromide Enlargements are a specialty with us, and developing both plates and films receive our careful attention and are done at factory prices. Our little "**Booklet of Good Things**" contains prices for all this work, and can be had with our new **Bargain List** (just out) for a one cent stamp.

O. C. Co.'s well known "Special" Blue Paper, 25 cents per yard (cut to any size and mailed free).

OBRIG CAMERA CO.,
163 BROADWAY, NEW YORK,
NEAR CORTLANDT STREET.

We have a new KODAK and KODET booklet ready for distribution.

YOU WILL LAUGH

WHEN YOU SEE THE HUMOROUS ILLUSTRATIONS IN

Photographic Amusements,

By WALTER E. WOODBURY (Editor Photographic Times.)

BUT You can find out how to make them too .All sorts of the grotesque effects with the camera, including spirit photographs, doubles, caricature portraits, etc., etc. *Over 100 Illustrations.* . . . .

Price, in paper covers, $1.00; cloth, $1.50.

For sale by all Photographic Dealers, or by

The Scovill & Adams Company of New York,
NEW YORK CITY.

STEINBACH & CO., MALMEDY, GERMANY,

Manufacturers of **Photographic Papers**

For Solar and Bromide Enlargements, Salting, Albumenizing, and Baryta Coating;

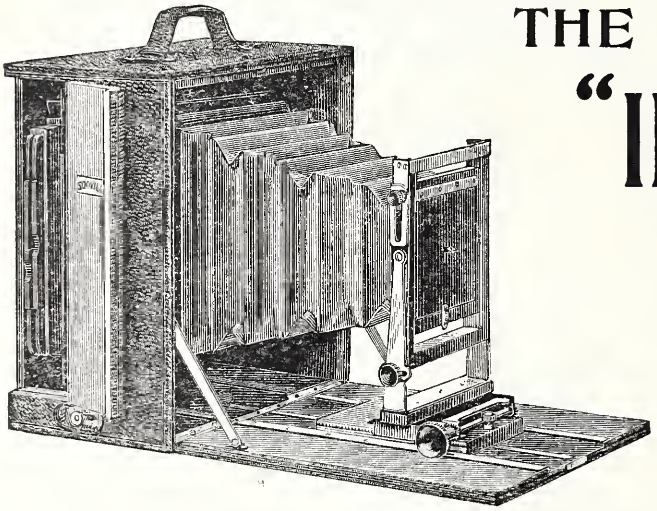
UNEXCELLED FOR BLACK AND BLUE PRINTING,

BARYTE PAPERS, GLOSSY AND MATT SURFACE.

SEND FOR SAMPLES AND ESTIMATES.

NEW YORK OFFICE:
28 HOWARD STREET.

PAUL PUTTMANN,
Sole Agent for the U. S. and Canada.



THE IMPROVED "IRVING-CLAY" CAMERA

THIS "fin de siècle" Camera, as it has been called, marks the highest attainment in camera manufacture *at the end of this century*. It is made at the works of the well-known American Optical Company, which in itself is a guarantee of perfection in durability of construction and fineness of finish.

A preliminary camera of this name was introduced some weeks ago, and the entire stock was quickly sold. The **Improved Irving-Clay** fully justifies its name, as it is a much improved form of the first camera of this class introduced. It contains two double holders instead of one, and the entire construction of the camera has been improved, with many useful and valuable features added.

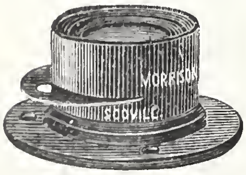
The Improved Irving-Clay combines the best features of the well-known "Henry Clay" and "Irving" Cameras, as its name indicates, and is the only hand and tripod folding camera with reversible self-adjusting spring back, and other features characteristic of these two cameras. It is made of thin spruce, highly polished, and is therefore extremely light and portable. It is covered with the best grade of leather, and possesses all the movements—swing back, front focus, shifting front and movable front boards—and conveniences which an "up-to-date" camera should have.

PRICE:		
	6½ x 8½, with *two* Double Irving-Clay Plate Holders,	$45.00
	8 x 10, " " " " "	50.00

The Scovill & Adams Company of New York,

60 and 62 EAST 11th STREET, NEW YORK.

MORRISON WIDE-ANGLE VIEW LENSES.



These lenses are absolutely rectilinear; they embrace an angle of 90 degrees, and are the most rapid *wide-angle* lenses made.

No.	Diameter of Lens.	Size of Plate.	Equivalent Focus.		Price.	
0	1 inch	3¼x4¼ inch	2½ inch	each,	$20.00	These 5 sizes will fit into 1 flange.
2	1 "	4 x 5 "	3½ "	"	25.00	
3	1 "	4¼x 6½ "	4¼ "	"	25.00	
4	1 "	5 x 8 "	5¼ "	"	25.00	
5	1 "	6½x 8½ "	6½ "	"	25.00	
6	1 "	8 x10 "	8 "	"	30.00	
7	1¼ "	11x14 "	10½ "	"	40.00	These 2 sizes will fit into 1 flange.
8	1¼ "	14x17 "	14 "	"	50.00	

☞ Nos. 1 to 6 are all made in matched pairs for stereoscopic work. The shorter-focused lenses are especially adapted for street and other views in confined situations. For general purposes, a pair of No. 5 lenses will be found most useful.

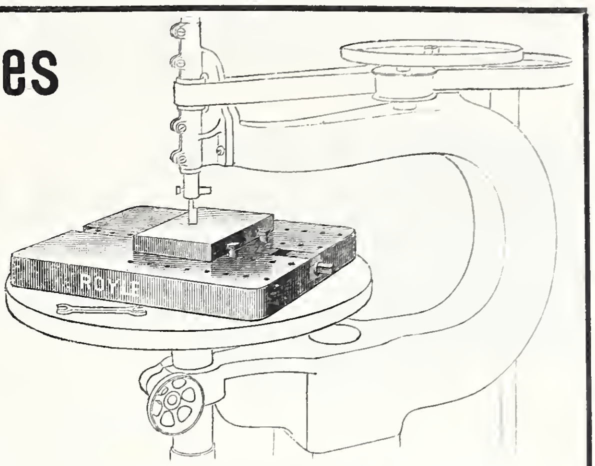
FOR SALE BY ALL DEALERS.

Without Proper Appliances

Photo-engraving is a slow and expensive business. It has been our Study, for many years, to develop and perfect a line of machines for simplifying and expediting the work of preparing and blocking plates, and we now offer outfits of tried merit and great economic value.

Write for particulars.

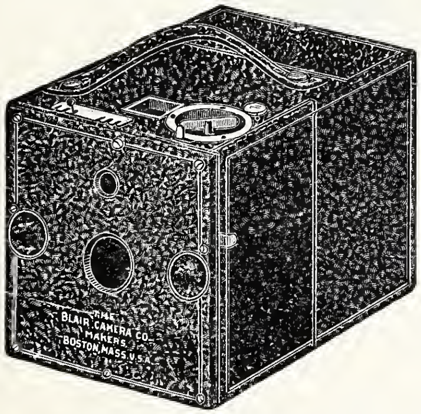
JOHN ROYLE & SONS,
PATERSON, N. J., U. S. A.



The Hawk-Eye, Jr.

for the Professional as well as the Amateur.

Price, $8.


THE BLAIR CAMERA CO. MAKERS. BOSTON, MASS. U.S.A.

Measures but 4¼ x 4¾ x 6 inches, has a square finder, automatic time register, improved time and instantaneous shutter, with different speeds; loads in broad daylight and can be used with film for 12 or 25 ex. or glass plates.

Send for our catalogue of New Cameras.

THE BLAIR CAMERA CO., Manufacturers, 471 Tremont Street, Boston.

THE S P C

ACID FIXING AND HARDENING COMPOUND

For NEGATIVES, TRANSPARENCIES, LANTERN-SLIDES and BROMIDE PAPER.

Destroys all developing fog and yields peculiarly beautiful and permanent results.

This solution can be used repeatedly so long as it fixes. It can also be used as a reducer of over density by a long continued treatment.

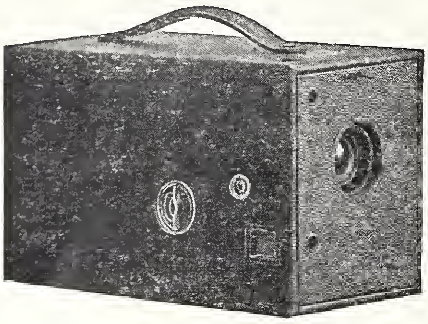
Price, in one lb. packages, only 25 cts. | In one-half lb. packages, only 15 cts.

FOR SALE BY ALL DEALERS.

THE SUNART Magazine Camera.

FIVE STYLES.
Price from $25 to $45.

The only practical Magazine Camera. Holds 24 cut sheet films, 4x5 inches, already loaded in carriers for you. Films guaranteed.



"VENI!" "VIDI!" "VICI!"

SUNART Folding Camera.

All sizes from 4x5, 5x7, 6½x8½, 8x10.

Ranging in price from $20 to $100.

The smallest up-to-date Folding Camera. Will carry three double plate-holders for glass or roller holder, for 48 exposures on films. First-class Lenses and Shutters guaranteed. The finest grade of workmanship.

SEND FOR CATALOGUE.

For Sale by all Photo Stock Dealers.

SUNART PHOTO CO., Rochester, N. Y., U. S. A.

Have You

Secured

Your

ZEISS

ANASTIGMATIC

LENS

Yet?

Be sure

You get

One

Made by

Carl Zeiss,

of Jena.

Wheeling at night,
With the "Search Light"
—Is a Pleasure.

The 1897 SEARCHLIGHT

BICYCLE LANTERN includes all its superior features of last season, with additional attractions which will be welcomed by all bicycle riders.

Reflecting surfaces are always bright and will not become tarnished. Can use kerosene or naphtha. By the new method of attaching to the wheel it cannot jar out.

PRICE. - - $5.00

Send for cuts for your catalogues and circulars to

BRIDGEPORT BRASS CO.,
BRIDGEPORT, CONN.

Or 19 Murray Street, New York; 85-87 Pearl Street, Boston; 17 N. 7th Street, Philadelphia.

THE SCOVILL MAGNESIUM COMPOUND

IS ENTIRELY FREE FROM POISONOUS AND EXPLOSIVE INGREDIENTS.

In order to demonstrate this, quantities have been eaten at various times. It has often been pounded in a mortar to show that it does not explode.

FOR SALE BY ALL DEALERS.

Standard Papers for Photographic Processes.

B. F. K. RIVES

FOR ALBUMENIZING, ARISTOTYPE (GELATINE AND COLLODION), BROMIDE, SOLAR
CHEMICALLY PURE PHOTO BLOTTING PAPER.

SEND FOR SAMPLES AND ESTIMATES.

NEW YORK OFFICE:
621 Broadway (Cable Building).

BLANCHET FRÈRES & KLÉBER,
RIVES—ISÈRE. (FRANCE.)

THE

PHOTOGRAPHIC PRIMER

BY J. C. WORTHINGTON & J. C. MILLEN, M.D.

A PRACTICAL GUIDE FOR AMATEUR PHOTOGRAPHERS, WHICH DESCRIBES IN CLEAR, CONCISE LANGUAGE THE APPARATUS, THE PLATES, THE SOLUTIONS, AND TELLS HOW TO USE THEM.

IT GOES BEYOND THIS AND CARRIES THE WORKER THROUGH DEVELOPMENT, PRINTING, MOUNTING AND ENLARGING IN SUCH A PRACTICAL AND THOROUGH STYLE THAT EVEN THE TYRO MAY RELY ON IT AS A GUIDE FROM FIRST TO LAST.

THE BOOK IS A LARGE 16 MO. OF SOME HUNDRED AND SIXTY PAGES, HANDSOMELY PRINTED ON GOOD PAPER AND BOUND IN ART CANVAS.

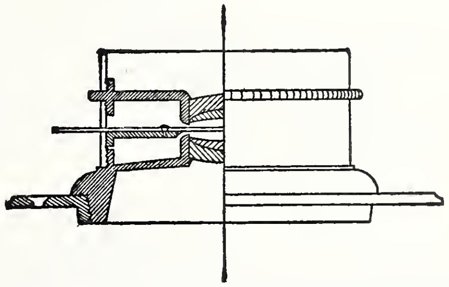
⁂

SENT POST PAID ON RECEIPT OF ONE DOLLAR. J. C. MILLEN, 919 & 921 ARCH ST., PHILADELPHIA, PA.

The Unrivaled

STEINHEIL LENSES.

SERIES IV. **Rapid Wide-Angle,** specially designed for landscape work and architecture, but can also be advantageously used for flash-light interiors and copying.



SERIES V.

Extreme Wide-Angle, for architecture and interiors, and for very high, broad objects taken from short distances.

The Scovill & Adams Co. of N. Y.,
60 and 62 EAST 11th STREET,
NEW YORK, N. Y.

CLÉMENT & GILMER, 8 & 10 Rue de Malte, PARIS,

Manufacturers of HIGH-GRADE PHOTOGRAPHIC LENSES.

PERFECT ANASTIGMATS! F. 7 IRIS DIAPHRAGM. ANGLE OF VIEW 80°.

QUALITIES:

Marvellous Covering Power,
Uniform Flatness of Field,
Brilliant Illumination,
True Perspective,
Remarkable Depth of Focus,
Defiant Rapidity.

Nos.	Equiv. focus	Covers at F. 10	Covers at F. 16	Covers at F. 40	Price.
1.	6	4 x 5	5 x 6	5 x 8	$27.00
2.	7¾	5 x 8	6½ x 8½	7 x 9	43.00
3.	10½	7 x 9	8 x 10	10 x 12	54.00
4.	12	8 x 10	10 x 12	11 x 14	67.00
5.	14	10 x 12	11 x 14	12 x 16	87.00

To be had from all Dealers in Photo Supplies.

NOTICE.—We hereby declare, that the Anastigmats described above form no infraction to the patent rights claimed for lenses bearing this or any other title. Stock dealers can, therefore, handle them freely without fear of interruption.

"New Process Walpole Hypo."

(TRADE MARK.)

TRADE MARK.
1717—HORACE WALPOLE—1797.

This product differs in appearance from the old-fashioned large crystal Hypo. "New Process Walpole Hypo" is in fine, small crystals, being almost a powder, yet each particle is a well-defined Crystal.

It is NOT large Crystals reduced to powder by grinding.
It is produced by a new and direct process.

An attempt has been made to imitate it by grinding the large crystals, but the fraud is easily detected by anyone who has ever seen a sample of "New Process Walpole Hypo."

Advantages:
- **It is Chemically Pure.**
- **Dissolves Instantly.**
- **Great Ease and Facility in Handling.**
- **Requires No Filtering.**
- **Produces Perfectly Clear Plates.**
- **Free from Carbonates, Sulphate, Sulphides or Sulphites.**

Mail Sample Free to any address.

Just published: "All About Hypo and Useful Hints," for Photographers, containing 64 pages of useful information. It tells you why you should use the

WALPOLE DOUBLE REFINED CHEMICALS.

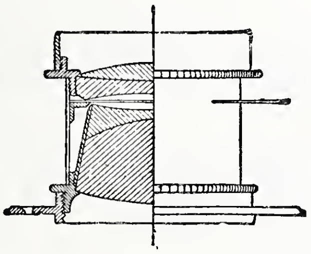
One cent invested in a postal card addressed to us, giving your address may save you many dollars and many hours of valuable time.

Walpole Chemical Co.

(BUSINESS FOUNDED 1870.)

WALPOLE, MASS.

THE UNRIVALED
STEINHEIL LENSES.



SERIES II.

The best and most rapid lens for general work for both professional and amateur photographers. Remarkable for its powerful and even illumination and sharpness.

Series III. The prototype of all rapid symmetrical and rectilinear combinations. Guaranteed equal to the most expensive lenses of its kind.

Write for catalogue to

THE SCOVILL & ADAMS CO. of N. Y.,
60 and 62 East 11th St. NEW YORK.

Stylish Designs in

Ladies' Watches to suit any gown. Black oxidized steel watches, plain or repousse very much in favor now for general wear or HALF MOURNING.

Also bright and charming shadings in enamel for evening dresses.

Our unquestioned guarantee with every watch.

The Waterbury Watch Co.
Waterbury, Conn. Send for Catalogue No.

Announcement Extraordinary!

Photographers' New Compound Developer.

Superior to anything produced yet; sent, postpaid on receipt of **30 cents,** enough to develop 100 5x7 negatives.

Photo Printing & Mfg. Co.
JOHN LOEBER, Prop. *1301 Broadway,*
BROOKLYN, N. Y.

THE TURNER-REICH
ANASTIGMAT LENS

TURNER-REICH
Anastigmat
Gundlach Optical Co.
ROCHESTER, N.Y.

Is **unsurpassed** by any in the market. It has an **aperture** of F. 7. 5., **marvelous depth of focus** and an **absolutely flat field.**

Prices lower than those of any other Anastigmat Lens.

MANUFACTURED BY
Gundlach Optical Co.
ROCHESTER, N. Y.

SEND FOR CATALOGUE.

ACTIEN-GESELLSCHAFT FÜR ANILIN-FABRIKATION
BERLIN
GERMANY
GERMANY
United States of America Patent No. 475372.
United States of America Patent No. 475372.
Dr. M. Andresen's EIKONOGEN
16 oz.
The right of utilizing Eikonogen for photography is protected by Patent in all countries. It is conceded to the buyer of this package and expires on the contents having been used
GESETZLICH GESCHÜTZT

Developers:

EIKONOGEN,
RODINAL,
AMIDOL.

* * *

Sold by all Dealers.

* * *

ASK YOUR DEALER FOR FORMULÆ.

CLEMONS' NEW MATT-SURFACE PAPER.

SOMETHING NEW UNDER THE SUN—A REVOLUTION IN THE ART OF MANUFACTURING.

After many years of scientific research a preparation for the salting of plain photographic paper has been discovered, by which method the finest printing results are obtainable. The advantages are apparent to all.

I.—Constant use will not discolor the silver bath.
II.—Will produce the finest detail in printing.
III.—Any desired tone may be obtained from sepia to jet-black with less gold than ever before.
IV.—The "*New Matt-Surface*" paper when sensitized will keep fresh for a long time if properly stored.
V.—The price has not been advanced.

For sale by

THE SCOVILL & ADAMS COMPANY of N. Y.,
60 and 62 East 11th St., New York.

Sample Sheets, by mail, 10 cents each.

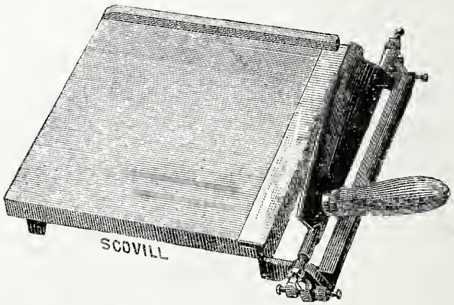
THE SCOVILL REVOLVING TRIMMER.

Has the many advantages, which its name implies, as follows:—

It cuts the paper for the print without removing it from the board or sliding it thereon.

The knife is always in position and sharp, being self-sharpened by the motion which the revolution gives.

It is very light and attractive-looking and is perfectly suited to the uses of both professional and amateur photographers.



Price (Size of knife ten inches.) Only . . . $4 00.

FOR SALE BY ALL DEALERS IN PHOTOGRAPHIC MATERIALS AND

THE SCOVILL & ADAMS CO. OF N. Y., Trade Agents.

The Triplex Shutter,

the old reliable, still more than holds its own as the shutter finally fixed upon for all-round work, when the cheap and inferior articles preceding it are discarded.

What are its advantages?

It is optically correct, gives good illumination, and has a real range of speed from time to one one-hundredth of a second.
See our Crculur on these points.

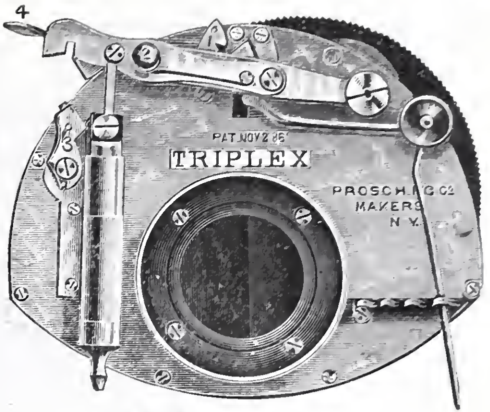
PRICES $14.00 UP.

ATHLETE shutter for rapid Stereoscopic Triplex.
Detective Triplex for detective cameras.

FLASH LAMPS.

Lightning Storage Lamp,	$4 50
Professional Storage Lamp,	9 00

Circulars on Application.



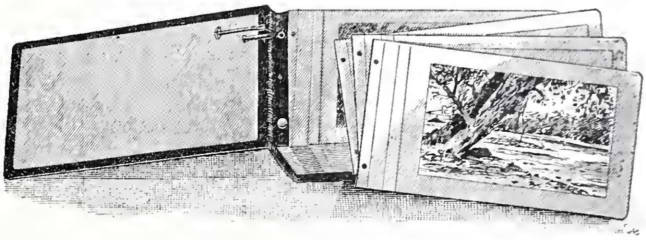
PROSCH MFG CO.,
389 BROOME ST., NEW YORK.

THE REGENT ALBUM.--INTERCHANGEABLE LEAVES.

The Regent Album combines neatness with durability.

The patent interchangeable feature is constructed in such a manner as to allow the leaves to be readily removed and replaced with little or no trouble and in the twinkling of a moment.

The leaves of The Regent Album lie absolutely flat and are perfectly rigid in the back.



PRICE LIST.

Each Album Containing 25 Leaves.

No. 1— 6 x 7	$1 25	Extra Leaves, White or Gray, per doz.,	$0 35
No. 2— 7 x 10	1 50	" " " " " "	45
No. 3—10 x 12	2 00	" " " " " "	75
No. 4-11 x 14	2 50	" " " " " "	1 00

Leaves for Squeegee Photographs.

No. 1— 6 x 7	per doz.,	$0 50
No. 2— 7 x 10	" "	75
No. 3—10 x 12	" "	1 25
No. 4—11 x 14	" "	1 50

The Regent Albums are bound in full cloth, handsomely embossed, finished with gilt title, and enclosed in a neat box.

THE LEAVES AND COVERS ARE ROUND CORNERED.

THEY ARE MANUFACTURED AND PATENTED BY **FELIX REIFSCHNEIDER.**
FOR SALE BY ALL DEALERS AND THE TRADE AGENTS,
THE SCOVILL & ADAMS CO. OF N. Y., - - - - 60 and 62 East 11th St., New York.

DO YOU MAKE

FLASH LIGHT PICTURES?

IF SO YOU MUST KNOW

BLITZ PULVER

The Standard Flash Light Powder in the United States.

60 cents per package.

For Igniting Blitz Pulver use McCollin's Igniter, - - Price $1.50

For Interiors, where quickness is not needed, use Hemperley's Magazine Flash Lamp for Magnesium Powder only, Price $2.75

For particulars of the above, send for our circulars.
Send 25 cents for a complete book on Photography, or a copy of *American Journal of Photography*.

THOS. H. McCOLLIN & CO.,
Photo Specialists,
1030 Arch St., PHILADELPHIA.

"NON-COCKLE,"

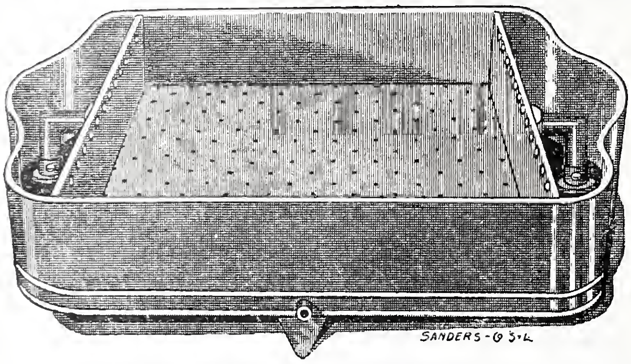
FOR MOUNTING PRINTS.

GUARANTEED NOT TO COCKLE.

40 Cents per Bottle.

For Sale by all Dealers in Photographic Goods.

THE CALIFORNIA AUTOMATIC PRINT WASHER,



WILL H. LEIGH, Inventor.

The principle on which the Automatic Washer is constructed provides for a constant and complete change of water with an upward and circular motion from being forced through the small holes, and an automatic rocking of the tank gives the entire body of water exactly the same motion that separates the prints in the ordinary tray by rocking. With this apparatus prints never settle to the bottom of the tank, but float in the water and move gently from side to side.

The face of each print is in this way presented to the moving water and imperfect washing is an impossibility.

Prints require no watching nor handling with this washer, thus saving its cost in labor alone.

They are furnished in three sizes, and made and finished for service and wear.

PRICES.

12x12 inches	**$ 7.00**
20x20 inches	**$ 8.50**
25x25 inches	**$10.00**

Leigh's-Combination Photograph-Printing Frame.

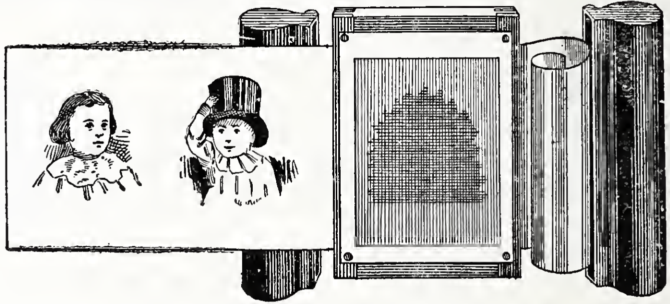
To quote the words of Mr. W. H. Leigh, the inventor, we would say that "The important point we claim for this frame is the doing away with joint lines, and equalizing the space between subjects for combination photographs, **WITHOUT CUTTING DOWN NEGATIVES**, thus often ruining them for future orders for single cabinets, etc

Prints from ten inches to ten feet in length can be made from as many negatives as desired. The prints can be made side by side, or one above the other Nothing makes better display work, nor attracts the public eye more than the **COMBINATION PHOTOGRAPH.**

We furnish two styles of frames, one to open in the regular way. taking paper the narrow way of the frame, and the other with lengthwise opening, taking the paper as shown in the illustration.

PRICES FOR EITHER STYLE COMPLETE.

5x7	**$2.50 each.**	6½x8½	**$3.00 each.**
5x8	**$2.50 each.**	8x10	**$3.50 each.**



FOR SALE BY DEALERS.

H. A. HYATT, Manufacturer, N.E. Cor. 8th & Locust Sts., ST. LOUIS, MO.

Port Huron, Mich.,
March 27th, '96.

MESSRS. ALLEN BROS.
Detroit, Mich.

Dear Sirs:

You ask our opinion of the SUTER LENS. You know we have a No. 8 B., and our opinion is as follows:

If you will write a letter in its praise, we will endorse anything you may say. Be sure to make your language strong enough and it will be all right.

Respectfully yours,
J. M. WHITE & CO.

BARGAINS ! !

SEND TO

The Scovill & Adams Co. of New York,
60 & 62 E. Eleventh St., New York,

. . . FOR PRICES OF THE . . .

High Quality American Optical Co's
VIEW CAMERAS,

Which they are offering at half price.

New York Dry Plate.

Easy to Work. | RECORD BRAND—Extremely Rapid.
Brilliant. | NEW HARVARD "—Rapid.
Clean. | CRESCENT "—Slow.

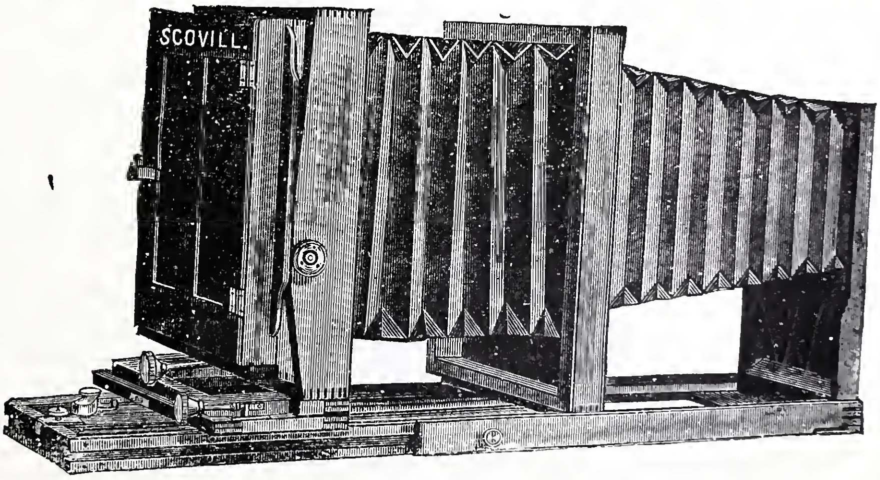
★ (STAR) BRAND—especially for soft portrait work with shortest exposures.

SOLD BY ALL DEALERS.

NEW YORK DRY PLATE CO. - - - GUTTENBERG, N. J.

THE AMERICAN OPTICAL COMPANY'S

UNRIVALED PORTRAIT CAMERAS.



The American Optical Company Portrait Cameras are manufactured from the best mahogany, French polished, and have double bellows, vertical shifting front, the V-shaped wooden guide, telescopic platform, and Lever Focusing Attachment, by which the most delicate focus can be adjusted with the utmost facility and ease.

No.	Size.		With Double Swing-back.
5	8x10 ins.,	with platform 30 in. long	$38 00
6	10x12 "	" " 36 "	48 00
7	11x14 "	extension " 48 " and vertical shifting front	64 00
8	12x15 "	" " 48 " do	72 00
9	14x17 "	" " 60 " do	76 00
10	16x20 "	" " 65 " do	88 00
11	17x20 ins.,	extension platform 65 in. long and vertical shifting front	$90 00
12	18x22 "	" " 70 " do	100 00
13	20x24 "	" " 72 " do	110 00
14	22x27 "	" " 72 " do	130 00
15	25x30 "	" " 90 " do	170 00

PHOTOGRAPHIC MATERIALS AND SUPPLIES
W. C. CULLEN
No. 61 WILLIAM ST. NEW YORK

SPECIAL NOTICE.

P. P. P.

PAGET PRIZE PLATES for Lantern Slides.

UNEXCELLED FOR QUALITY AND BRILLIANCY OF TONE.
HIGHLY SPOKEN OF BY THE PRIZE WINNERS.

Read what they say:

New York Camera Club,
New York, March 30, 1896.

Mr. W. C. Cullen:

Dear Sir:—In answer to your inquiry, would say, I consider the Paget Lantern Slide Plate as without a rival. It is the only plate within my knowledge on which a variety of pleasing tones, running through the blacks, browns, purples and reds, can be produced at will, by *development* alone.

Yours truly,
Wm. A. Fraser.

Society of Amateur Photographers of N. Y.,
March 26, 1896.

Mr. W. C. Cullen:

Dear Sir:—The Paget Lantern Slide Plates are superior to anything I have used. The majority of my prize slides were made with them.

Very truly,
W. B. Post.

W. C. CULLEN, Sole Agent for U. S.,
61 WILLIAM STREET, NEW YORK.

HIGH-GRADE ILLUSTRATIONS

FOR FINE BOOKS.

PHOTOTYPE. HALF-TONE. PHOTO-ENGRAVING.
PHOTO-LITHO. LETTER-PRESS PRINTING.

We are now prepared to furnish **Half-Tone Blocks** for typographical printing. The same excellence which characterizes our **Gelatine Work** will be given to this, and we solicit your patronage for a trial order.

These blocks are suitable for Catalogues and the cheaper forms of illustration, but for the better grade of work we recommend the Phototype.

We are also prepared to submit estimates for all kinds of Letter-Press Printing, and preparation of Catalogues in any of the above styles of work, and will in each case give the best of its kind.

F. GUTEKUNST, Pres.
M. GUTEKUNST, Sec. & Treas.

IMPERIAL PHOTOGRAPH GALLERIES,
712 Arch Street.

THE F. GUTEKUNST CO.,
813 and 815 Girard Avenue, and
1700 N. Broad St., Philadelphia, Pa.

THE Carbutt Plates, Films AND Specialties

MEET EVERY WANT OF THE AMATEUR, PROFESSIONAL AND SCIENTIFIC PHOTOGRAPHER.

"Eclipse" for Portraiture and Hand Camera exposures, and you have a Plate that has **Rapidity with Quality**.

Orthochromatic in three speeds, Sen. 23, 25 and 27 for Portraiture, Landscapes, Interiors and Copying Paintings.

B Sen. 16, for Landscape and Architecture. Unparalleled latitude of exposure makes it the "**Standard**" for beginners.

D. T. Non-Halation Plates. Double thick coating without Backing, and with Orthochromatic quality for Interiors and Landscapes.

Lantern Plates have no equals for Brilliancy and Uniformity.

X-RAY PLATES AND FILMS.

INDIVIDUALLY WRAPPED

In light proof wrappers, so that they may be used under the X-Rays without any further preparation. The composition of the Emulsion is such that the X-Rays are largely *Absorbed*, and allows of shorter exposure with the production of more detail in the *Radiograph* Negative than can be obtained on ordinary Dry Plates.

For Developer use Carbutt's J. C. Developing Tabloids, each box contains 96 Tabloids, price 75 cents.

THE FIRST X-RAY

Plates in the World were exposed Feb. 11th '96 at the Maternity Hospital, and Physical Laboratory of the University of Pennsylvania, reducing the time of exposure at *that date* from 90 to 20 minutes.

REDUCED FROM LIFE SIZE. Radiograph of Infant 4 days old.
Exposure 2½ Minutes on 14 x 17 Plate.

FOR SALE BY ALL DEALERS.

☞ ***Send to Factory for full list of PLATES, FILMS and SPECIALTIES.***

MANUFACTURED BY

JOHN CARBUTT,

Wayne Junction,
PHILADELPHIA.

KEYSTONE
DRY PLATE AND FILM
WORKS.

"Some Mounting Paste, please" says Inexperienced, and gets what the salesman pleases.

"Some *HIGGINS' PHOTO MOUNTER,"*

says Experienced, and gets what pleases **him.** The difference is in the articles, and the moral is—if you want a **good thing** ask for it.

HIGGINS' PHOTO MOUNTER is a beautiful, pure, white adhesive, finely secnted. A perfect homogeneous solution in a soft, pasty form, from which the water never separates, as in the common starch or flour pastes. Its beautiful, soft, unctuous consistency, and its wonderful smooth and easy spreading qualities (non fluid at rest but fluid under the movements of the brush) are possessed by no other adhesive, and are of the greatest importance in perfect and easy mounting. Does not strike through nor warp, adheres instantly and powerfully, dries quickly and prevents curling off at the edges. Guaranteed never to change or deteriorate. Unequaled for mounting photographs, textile samples, scrap-books, tissue work, and general use as a substitute for mucilage.

REFUSE ALL IMITATIONS.

FOR SALE BY ALL PHOTO SUPPLY HOUSES.

A 3-ounce jar, prepaid by mail, for thirty cents, or descriptive circulars for nothing, from

CHAS. M. HIGGINS & CO., Sole Manufacturers,
London Office, 106 Charing Cross Road. 168-172 Eighth St., Brooklyn, N. Y., U. S. A.

REDUCTION IN PRICE.

The List Price of the

Cramer Isochromatic Plates

is now the same as that of our regular Plates.

We are also now making the

Cramer Contrast Plates

to meet a long felt want.

Full Descriptive Catalogue sent to any address upon application.

New York Office, 265 Greene Street.

G. CRAMER DRY PLATE WORKS, - ST. LOUIS, Mo.

PHOTOGRAPHIC GOODS

OF EVERY DESCRIPTION.

SWEET, WALLACH & CO.

215-221 WABASH AVENUE,
CHICAGO.

Largest and Best Assorted Stock in the World

WUESTNER'S EAGLE DRY PLATE CO.

Our Plates Commence with Emulsion No. 5000 and are made in three grades of speed:

X Slow.
X X Medium.
X X X Quickest Plate Made.

Wuestner's CYCLONES (White Label, XXX)

For snap-shot and quick studio work. They are the quickest, the cleanest, and most brilliant plates in the market, and have more latitude than any known brand.

Wuestner's JERSEY BEAUTIES (Green Label, XX)

For general use. They are unexcelled for viewing, and are used by seven-eighths of the view photographers throughout the country.

As a guide to compare the speed between all known American and European Plates: At the test made by Watkins' Sensitometer, in England, **May, 1896,** our Cyclone XXX and Orthochromatic XXX Plates showed the highest test, number 150, while the European brands only reached the 120 mark.

Our plates fix and print in half the time that others require. No blistering or frilling with any of our brands of plates. Try them once, compare discount and plates and you will use no others.

WUESTNER'S EAGLE DRY PLATE CO.

Jackson Place, JERSEY CITY, N. J.

Enjoy Your Cycling Tours by Riding

The Liberty

America's Representative Bicycle.

It is built for ease and strength, and succeeds in both cases. The Art Catalogue for 1896 is the handsomest that has ever been issued. It will be sent upon application—no stamps necessary.

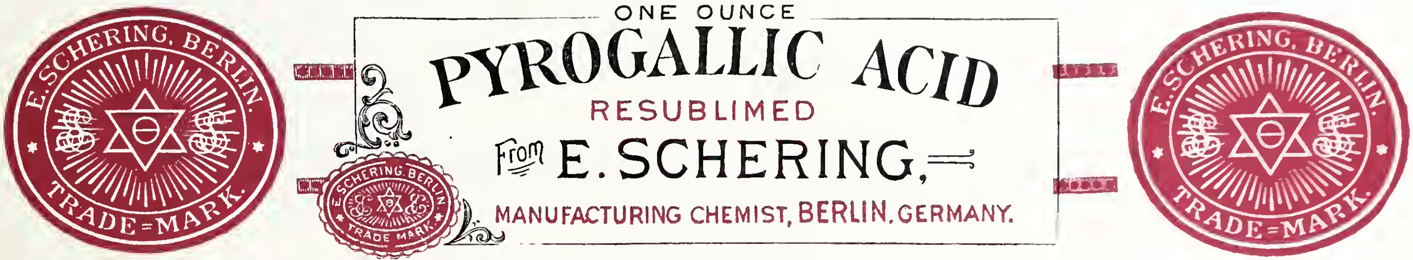
The Liberty is sold in all cities of prominence in the United States and Europe.

LIBERTY CYCLE CO.

4 Warren Street, NEW YORK.

When purchasing a Developer please be particular to specify **Schering's** the oldest and most favorably known brand.

Put up with labels and seals as per fac-similes here given.



ONE OUNCE
PYROGALLIC ACID
RESUBLIMED
From E. SCHERING,
MANUFACTURING CHEMIST, BERLIN, GERMANY.

E. SCHERING, BERLIN. TRADE-MARK

REGISTERED. REGISTERED.

THE STANDARD OF THE LAST—THIRD—EDITION OF THE GERMAN PHARMACOPŒIA.

See that you get the Genuine "Schering's." Excelled by none.

Send Orders to your Dealers, or to

THE SCOVILL & ADAMS COMPANY OF NEW YORK.

Remember

THAT

"Three Crown"

Albumen Paper

Is absolutely the BEST.

WHY?

Because none but the Best of the Rives Paper is selected for Albumenizing the THREE CROWN BRAND.

It is therefore free from the imperfections often to be found in other brands, which arise from defects in the plain paper, and hence cannot be avoided.

DO YOU USE

"PEERLESS," "SPECIAL," "KELAT" or "OPTIMUS."

IF NOT, WHY NOT?

You can always depend on them as the *best Emulsion Papers* on the market.

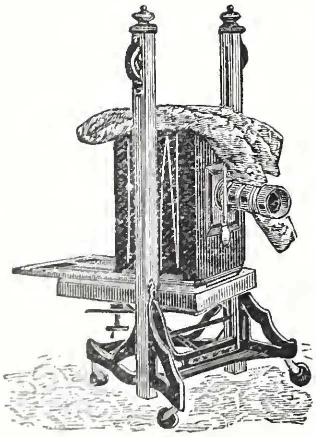
"THE PROOF OF THE PUDDING
is in the eating,"
and
PRACTICAL USE.

SEND FOR PRICE LIST.

ORDER A GROSS.

TRY IT and you will BUY IT!

BROWN & PALMER, - - - Rochester, N. Y.



700 Photographers are NOW USING the

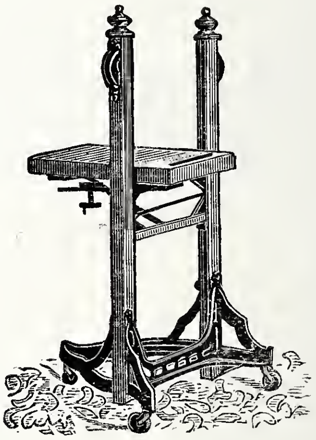
SEMI-CENTENNIAL CAMERA STAND.

THIS BEATS THE RECORD.

All Dealers sell them.
All Photographers like them.
All should have them.

Send for Price List. The ONLY Stand that gives satisfaction.

HORGAN, ROBEY & CO.
34 Bromfield St., Boston, Mass.



ORDER FROM YOUR DEALER

U. S. ARMOR BRAND PRINTING-OUT PAPER
HAS AN INSOLUBLE FILM AND DOES NOT CURL,
GIVES PURE WHITES, AND IS ALWAYS RELIABLE.

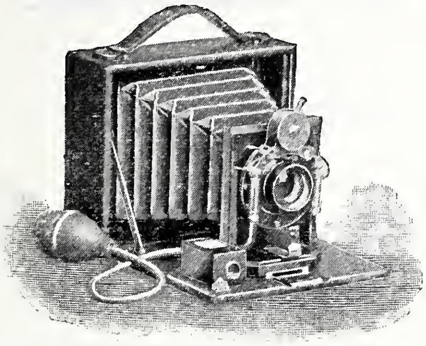
CABINETS, $1.00 PER QR. 20 x 24, $2.00 PER DOZ.

OTHER SIZES IN PROPORTION.

SEND 20 CENTS IN STAMPS FOR SAMPLE PACKAGE.

UNITED STATES ARISTOTYPE,
Bloomfield, N. J.

The Pony Premo



THE LATEST,

THE SMALLEST,

THE BEST

CAMERA ON THE MARKET.

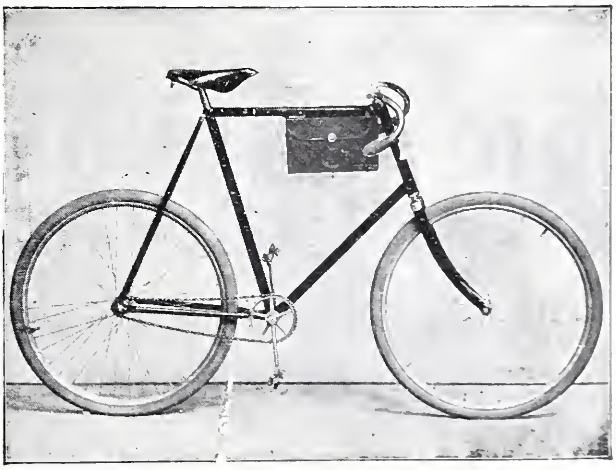
4 x 5 closed only 5¼ x 6⅛ x 2 inches, - - Weight, 26 ounces.
5 x 7 closed only 7 x 9 x 3 inches, - - - Weight, 48 ounces.

Particularly Adapted for Wheelmen and Tourists.

* * *

THE PREMO PONY may be attached to the frame of a Bicycle the same as a tool bag.

Its manipulation is so simple that with little experience excellent results may be obtained.



Fitted with our new Victor Shutter and Rapid Rectilinear Lens.

Onr Illustrated Premo Catalogue may be had for the asking.

Rochester Optical Co.,

ROCHESTER, N. Y.

2 THINGS

To Remember when Purchasing a
Photographic Outfit:

CONVERTIBLE
ZEISS ANASTIGMAT
LENSES

Are Unequaled in
SPEED
FLATNESS
DEFINITION

AND THE

IRIS DIAPHRAGM SHUTTER

Is the Only Shutter made giving Correct and Equal
Exposure with Uniform Timing.

New Model permits Graduation for any number of sets of Stops.

MANUFACTURED BY

Bausch & Lomb Optical Co.,

ROCHESTER, N. Y. **NEW YORK CITY.**

Attached for use.

Don't accept imitations of our '95 Styles,

Packed in Case.

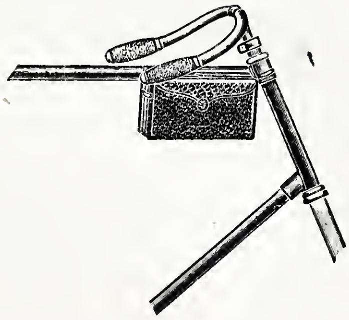
But insist on having the latest, our '96 models.

Rack and Pinions, Double Swingbacks,

Double Sliding Fronts, Pneumatic Release,

Iris Diaphragms, New Poco Shutter,

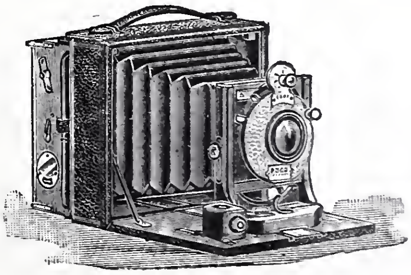
Is but part of our Improvements for 1896 model.



Attached for Carrying.

POCO FOLDINGS
. . AND . .
CYCLE POCOES.

"Pocoes take everything in sight."



Open.

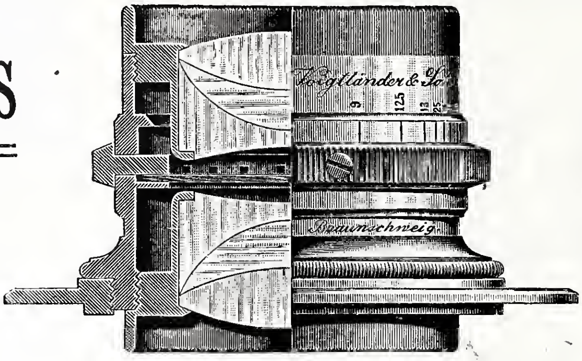
Rochester Camera Co.,

ROCHESTER, N. Y., U. S. A.

The Finest Lens yet Produced

: : : IS : : :

Voigtlander's Marvelous COLLINEAR LENS.



: : : THE FAMOUS : : :

Voigtlander Portrait and Euryscope Lenses,

Filling special needs, continue their popularity unabated.

The Genuine . **DARLOT LENSES** for all kinds of work, also best for . . . STEREOPTICONS are still to the fore.

The above Lense for sale by all Dealers and the Sole American Agents :.

BENJ. FRENCH & CO., - - Boston, Mass.

THE PLATINOTYPE.

(Patent applied for.)

Mr. Wm. M. Hollinger, late of Dayton, Ohio, now of New York city, has favored us with eight negatives of selected studies from which to make Platinotype Prints, and every Photographer in the land should have a set from which to "Draw a Lesson" in portraiture.

The set of eight studies, mounted on Rembrandt cards, by mail on receipt of $1.50.

We continue to supply perfect Platinotype Papers, and the purest Potassic-Chloro-Platinite.

WILLIS & CLEMENTS,

SEND FOR
ILLUSTRATED
PAMPHLET.

1624 Chestnut Street, PHILADELPHIA.

OFFICE OF

CHAS. M. HIGGINS & CO.

MANUFACTURERS OF

Refined Adhesives, Etc.

168-170 EIGHTH STREET.

Notice of Infringement Suit on Patent of Chas. M. Higgins.

BROOKLYN, N. Y., DECEMBER 15, 1896.

TO THE TRADE.

We desire to inform you that we have just brought suit against a dealer in New York City, who after ample warning and specific notice from us, persisted in infringing our Patent rights by continuing to sell "Stafford's Concentrated White Paste" and "Stafford's Invincible Liquid Gum." These two articles are manufactured by some parties doing business under the name of S. S. Stafford in New York City, and we consider the said articles to be imitative of our Photo-Mounter and our Taurine Mucilage respectively, and to be an infringement of our Patent No. 466,239 of December 29, 1891, of which we gave you previous notice in our circular of September 21, 1896.

You are doubtless aware that a Patentee has the right to sue either an infringing manufacturer or dealer, as he may elect, and it was necessary to bring suit against this dealer, because while the Trade has generally recognized our rights and co-operated with us in agreeing not to sell infringing goods, there were a few dealers here and there who have been misled to believe that we had no legal rights, or that if we had, we were in vulgar phrase "playing a bluff," and would not or could not enforce them. Such dealers, and the manufacturers behind them, could therefore only be convinced of their mistake by the course we have taken.

We have made every reasonable effort to avoid any trouble to dealers in this matter, but in view of the several misleading statements made by infringers, and their influence on some dealers, it was necessary to take this course to have our rights respected and to vindicate our sincerity and good faith to the Trade in general, and we are confident that the Trade will generally commend us in this position.

It is also proper that we should here call the attention of the Trade to a misleading statement made in a circular issued by Stafford October 15, 1896. In this circular, which purports to be an answer to our Infringement Notice of September 21, 1896, and is signed in the name of "S. S. Stafford," who died over a year ago, it is stated that the Stafford Paste is made by a formula known only to **"myself,"** and **"that it is composed of ingredients different from those used by any other manufacturer."** This latter statement we pronounce absolutely false or misleading. Repeated analyses of the Stafford Paste made by our experts show conclusively that it contains the ingredients of our Paste specified and claimed in our Patent No. 466,239, and in their opinion is a clear infringement thereof. This question of identity and infringement will now be submitted to the Courts for legal decision, and we will not discuss it further.

We again warn the trade of their liability in the further sale of the "Concentrated White Paste" and "Invincible Liquid Gum" above mentioned, on which suit is now brought, but by communicating with us satisfactory arrangements can be readily made as regards infringing goods which they may now have on hand.

Very respectfully,

Chas. M. Higgins & Co.

SCOVILL MAGNESIUM CARTRIDGES

Are the best

Why?

Because they give a more actinic light, produce less smoke, and are safer than any other in the market.

THE SCOVILL & ADAMS CO. OF N. Y.

60 and 62 East 11th Street.

REDUCTION IN PRICE.

The List Price of the

Cramer Isochromatic Plates

is now the same as that of our regular Plates.

We are now also making the

Cramer Contrast Plates

to meet a long felt want.

Full Descriptive Catalogue sent to any address upon application.

New York Office, 265 Greene Street.

G. CRAMER DRY PLATE WORKS, - ST. LOUIS, Mo.

Nepera Chemical Co.'s Products.

REX and
NEPERA, Glossy Printing-out Papers with a hardened gelatine film.
Rex 90 cents.—Nepera $1.35 a gross.

REMBRANDT, a Matt Printing-out Paper.

NEPERA-BROMIDE,

THE BEST YET MADE

Platinoid, for Platinum effects.
Enameled.
Rough-Surface.

VELOX, The Paper of the Future.

Matt or glossy. 500 times quicker than albumen. Gives any tones. Can be printed by daylight or by artificial light. No dark room required. Keeps indefinitely. Not affected by heat or dampness.

PERMANENT RESULTS.

50 Cents for trial packages, containing 2 doz. cabs. or 4 x 5 developer and two sample prints.

Nepera Chemical Co.,

NEPERA PARK, N. Y. - - Sole M'f'rs.

THE WATERBURY ALBUM

Is the latest thing on the market in the way of an Interchangeable Leaf Album.

Embossed Black
Cloth Covers,
White Leaves.

NOTE THE LIST PRICE.

7 x 10,	10 x 12,	11 x 14,
$1.10	**$1.60**	**$2.00**

◆

THE SCOVILL & ADAMS CO. OF NEW YORK,
60 and 62 East 11th Street, New York City.

Look out for imitations of

REDUCED
PRICE LIST.

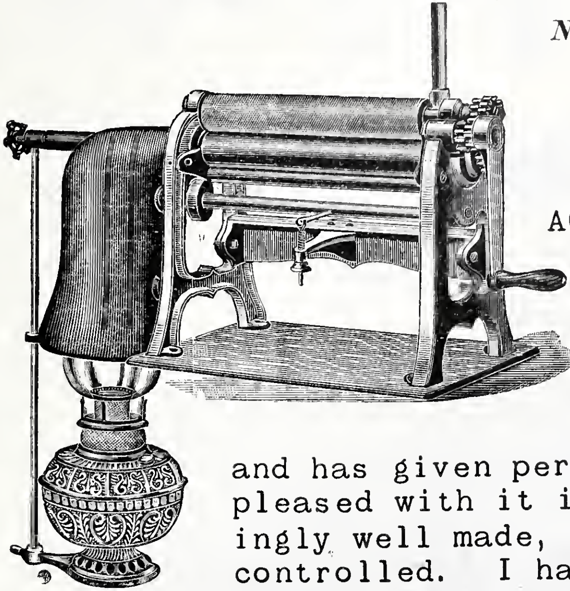
WATERBURY
CARDBOARD.

Look out for the genuine, too, and see that you get it.

WITH NEW PRICES.
SEND FOR
A SAMPLE

It is the Best and Cheapest.

ACME BURNISHERS



Note what a party says who had a Burnisher of another make and purchased one of our 15" Aristo Burnishers heated by oil:

Ithaca, N. Y., April 30, 1895.
ACME BURNISHING CO., Fulton, N. Y.

Gentlemen:

The "New Acme Aristo Burnisher" with oil heater, recently purchased of you for use in the department of drawing in Cornell University, has been well tested and has given perfect satisfaction. I am more than pleased with it in every respect. It is exceedingly well made, heats very quickly and is easily controlled. I have been able to obtain a finer finish with this burnisher than with any other I have ever used. Very truly yours,

E. C. CLEAVES, Sibley College, Cornell University.

This speaks for itself. The Acme Aristo Burnisher gives the best gloss and is the simplest Burnisher made and is the only hollow roll Burnisher made that can be heated by oil, gas or gasoline.

Remember it is fully guaranteed. Give the Acme Aristo a trial and be convinced as others have been.

ASK YOUR DEALER FOR NEW CATALOGUE.

ACME BURNISHER CO., Fulton, N. Y.

This illustration shows the **Thompson 10,000 candle power electric lamp** for studio use.

The only electric lamp on the market capable of lighting subjects **equal in every way to daylight.**

Now in use in many studios both ground floor and sky lighted.

Illustrated circulars giving full description mailed on application.

A. T. THOMPSON & CO., Mfr's,

26 Bromfield St., Boston, Mass.

SELLING AGENTS.

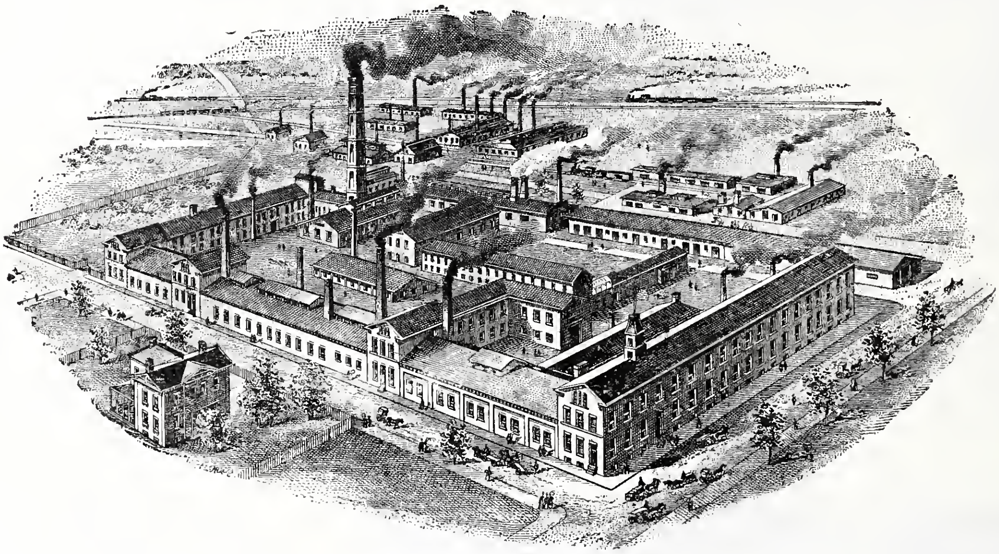
The Scovill & Adams Co., New York.
W. P. Buchanan, Philadelphia, Penn.
David Tucker, Buffalo, New York.
Stewart Electrical Syndicate, Lt'd,
103 New Oxford St., London, W. C.

CHAS. COOPER & CO.

ESTABLISHED 1857.

Manufacturing Chemists and Importers,

194 WORTH STREET,
NEW YORK.



WORKS AT NEWARK, NEW JERSEY.

Chemically Pure Photo Chemicals.

NITRATE SILVER, CHEMICALLY PURE CHLORIDE GOLD,
SULPHITE SODA CRYSTALS AND GRANULAR. : : : : :
: : LITMUS PAPER, ACID SULPHITE SODA SOLUTION,
COMMERCIAL AND CHEMICALLY PURE ACIDS, ETHERS
AQUA AMMONIA, SOLUBLE COTTON FOR COLLODION PAPER.

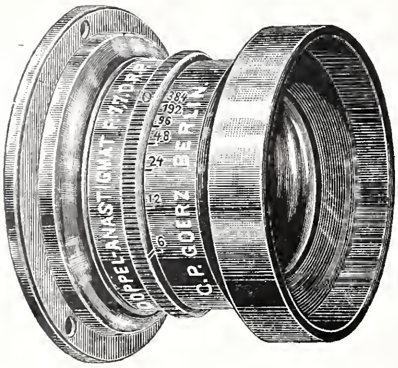
We Manufacture a full line of Chemicals,
Medicinal, and for the Arts and Technical purposes.

Bromo-Oxygen, a most efficient disinfectant and deodorizer. Can be diluted with 32 parts of water.

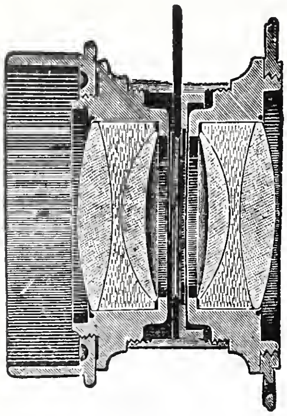
MONTHLY PRICE LIST ISSUED. REFINERS OF PHOTO SILVER AND GOLD WASTE.

CARDS FOR MOUNTING PHOTOGRAPHS.

A. M. Collins Manufacturing Co.
No. 527 Arch St. PHILADELPHIA.



German Patent No. 74,437.
American Patent No. 528,155.



TRY THE GOERZ

Double Anastigmat

Before Buying Another Lens.

It will give you better definition, greater depth of focus and more illumination, over the whole of your plate than any other lens on the market.

FOR SALE BY ALL DEALERS OR

C. P. GOERZ,

52 Union Square East, - - - NEW YORK.

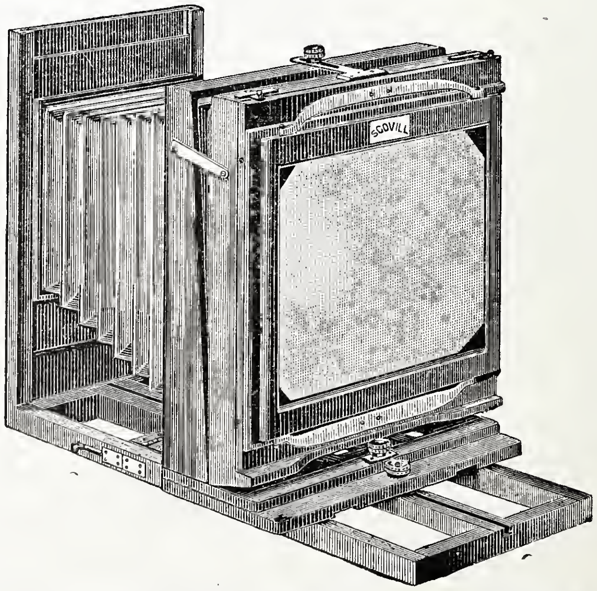
Factory at Berlin (Germany).

A NEW CAMERA

"The Reversible Landscape"

MADE BY THE AMERICAN OPTICAL CO.

To meet the demand for high-grade apparatus at popular prices. This camera is made of highly polished mahogany, with all the latest improvements, and patent self-adjusting ground glass frame, reversible back, and rising front.



PRICES:

6½ x 8½	Double Swing	$23.00
8 x 10	" "	25.00
11 x 14	" "	35.00
14 x 17	" "	50.00

THE SCOVILL & ADAMS CO. OF N. Y., 60 and 62 East 11th Street.

We make Three Brands of printing-out paper. Each brand has an individuality peculiar to itself, and covers a separate field of usefulness.

Blue Label,

For soft, delicate negatives.

Aristo, Jr.,

For medium to strong negatives.

Aristo Platino,

For carbon and platinum effects.

To meet the demands of Amateur Photographers we have placed on the market the following solutions:

AMATEUR GOLD, Per Bottle - - 50 cents.
AMATEUR PLATINUM, Per Bottle - 50 cents.

AMERICAN ARISTOTYPE CO.
Jamestown, N. Y.

Trade Agents:
E. & H. T. Anthony & Co.
New York.

THE LATEST!
THE BEST!

……

Empire Collodion Gloss

Empire Collodion Matt.

UNIFORM.
RELIABLE.

Every Sheet Guaranteed.

* * *

FOR SALE BY ALL THE TRADE.

MANUFACTURED BY

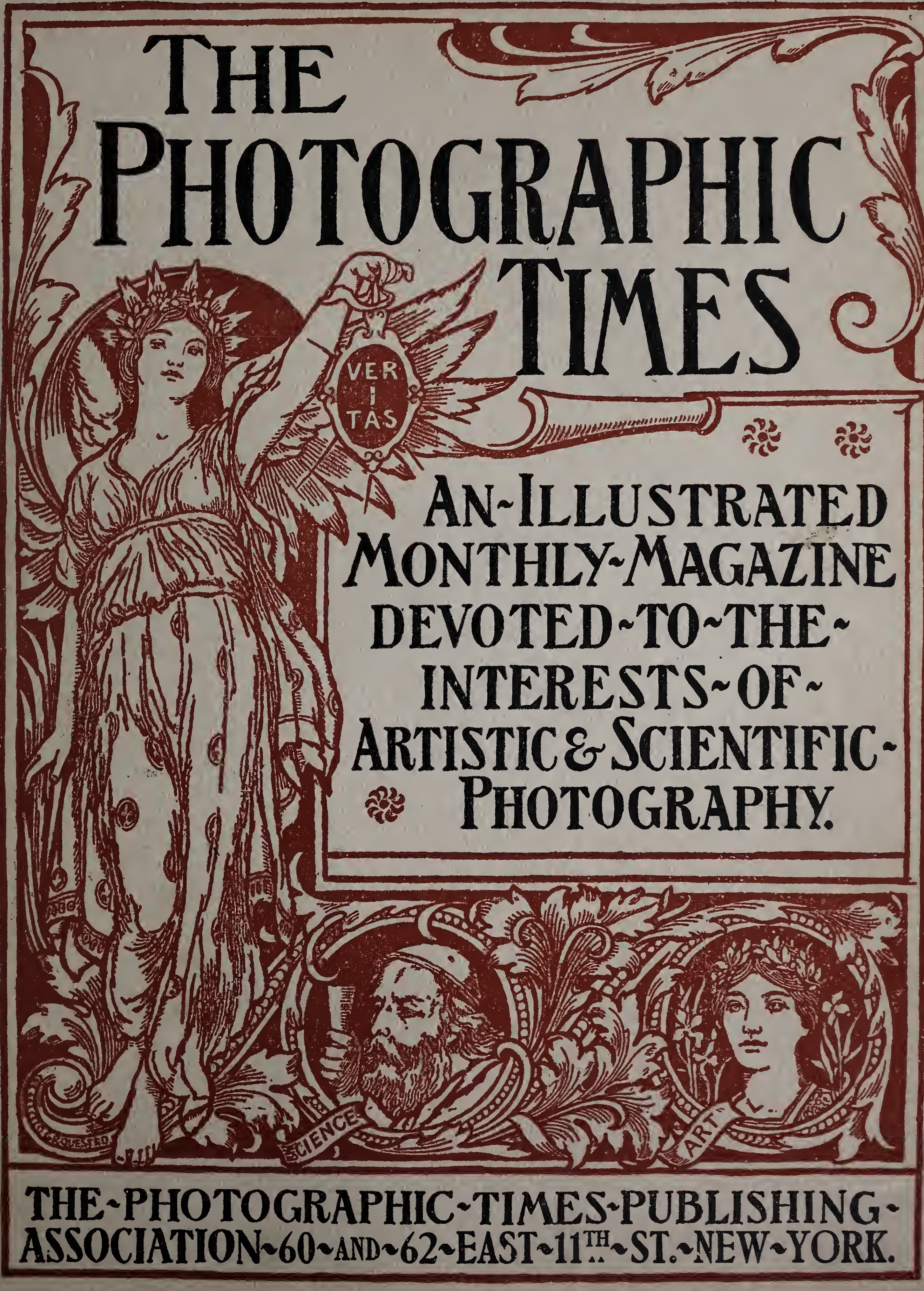
The Empire Photo Paper Company
EXPRESSLY FOR

The Scovill & Adams Company of N. Y.

60 and 62 EAST ELEVENTH STREET,

New York, U. S. A

Vol. XXIX. OCTOBER, 1897. Number 10.
FOUR DOLLARS PER ANNUM. SINGLE COPIES, 35 CENTS.



THE PHOTOGRAPHIC TIMES

AN ILLUSTRATED MONTHLY MAGAZINE DEVOTED TO THE INTERESTS OF ARTISTIC & SCIENTIFIC PHOTOGRAPHY.

THE PHOTOGRAPHIC TIMES PUBLISHING
ASSOCIATION 60 AND 62 EAST 11TH. ST. NEW YORK.

CONTENTS.

PAGE

Frontispiece—"Requiescat in Pace"—By Charles J. Berg.
Grace Kimball—By Sarony—Illustration........... 449
An Adaptation of Telescope Lenses for Photography—By Henry Skillman Curtis—Illustrated... 449
Enlargements by Amateurs—By R. R. Bourland... 451
Portrait of My Wife—By Lee Ferguson—Illustration 452
On the South Side—By H. G. Rogers—Illustrated.. 453
Landscape Photography—By H. C. Delery......... 454
Animal Studies—By Henry Dixon Sons—Illustrations........ 455
Allegro—By J. Wells Champney—Illustration...... 456
A Little Election Day Experience—By R. D. O. Smith—Illustrated........ 457
Naturalistic Photography—By P. H. Emerson. 459
Amsterdam—By A. Pieren—Illustration........... 462
The Ford—By Carroll T. Tyson, Jr.—Illustration.. 463
Intensification and Reduction—By the Rev. A. H. Blake, M.A........ 463
Encouragement—By Geo. D. Firmin—Illustration.. 463
Portrait—By R. W. Harrison 464
Signs of Spring—By R. E. M. Bain—Illustration... 464
Shielding Enlargements—By Cecil M. Hepworth—Illustrated........ 465
A Travelling Daguerreotyper—Illustration........ 468
Heliography as a Pioneer of Modern Civilization—By Julius F. Sachse........ 468
Small *V*. Large Negatives—By John H. Gear, F. R. P. S........ 469
The Old Lych Gate—By Alex. Keighley............ 470
Portrait—By J. Wells Champney.................. 470
A Miniature—What Does It Express?—By G. S. Southworth........ 471
Photo by Byron V. Tompkins—Bronze owned by Alex. Caldwell........ 471
The Art of Moving Photography.................. 472
The Biograph at Work in a New York Theatre—Illustration........ 472
The Dark Room and Reel for Developing Films—Illustration........ 473
Interior of the "Mutoscope."—Illustration......... 473
One of a Series of "Mutograph" Pictures taken at the rate of 40 per Second........ 474
"Mutograph" Pictures of Clay Pigeon Shooting and the Firing of a 10-inch Disappearing Gun....... 474
Photographing the Pennsylvania Limited—60 Miles an Hour—Illustration........ 475
"Mutograph" Pictures of a Blanket Court Martial at Governor's Island........ 476
Drying and Retouching Room—Illustration........ 477
Movable Stage for Photographing Scenes with the "Mutograph"—Illustration........ 478
Baby's Pap—By Carl Wolff—Illustration........... 479
Some Random Notes—By Milan P. Warner......... 480
Mid-Day—By H. P. Robinson.............Opposite 480
Editorial Notes........ 481
Japanese Photo........ 481
The New England Club's first Convention.......... 482
Some Remarks on Lantern Slides—By Alfred Stieglitz........ 483
To "Back" Plates Quickly and Cleanly—Illustrated 485
The Humorous Side of Photographic Dealing—By J. W........ 486
Notes........ 487
Photographic Patents........ 496
THE ENCYCLOPÆDIC DICTIONARY OF PHOTOGRAPHY........ 329

Sweetheart Adhesive Cloth = = =

A

Support for Photographic Prints,

Ready Prepared for Mounting.

A photograph mounted on this cloth can be folded and crumpled without cracking, or even creasing, the coated surface of the paper.

SEND FOR FULL PARTICULARS TO : : : : : :

The Scovill & Adams Co. of New York,

60 and 62 East 11th Street, New York.

ASK YOUR DEALER FOR IT.

THE GETTY CENTER LIBRARY

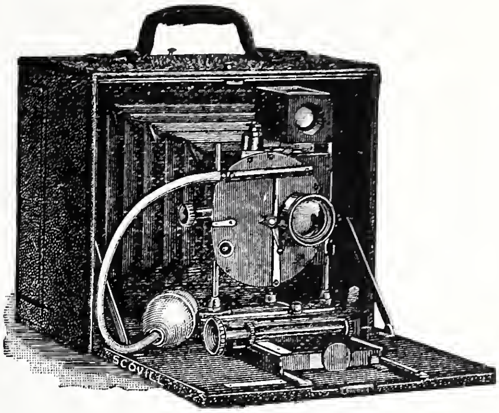
CAMERAS FOR NOTHING.

Our Special Offer.

TO ANYONE sending us twenty-five yearly subscriptions for this magazine we will give **Free of all charge** a beautiful 4 x 5 **Henry Clay Camera** complete with lens, shutter, etc,,

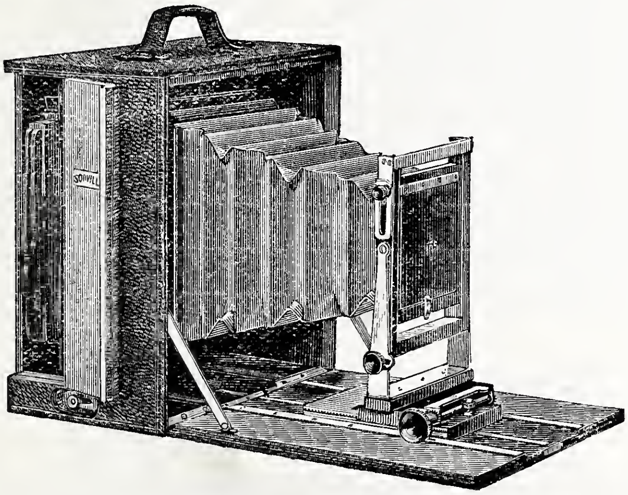
TO ANYONE sending us fifty yearly subscriptions to this magazine we will give **free of all charge** a magnificent 8 x 10 **Irving Clay Camera.**

BOTH these cameras are marvels of workmanship and the finest grade of apparatus manufactured by the American Optical Co.



4 x 5 Henry Clay Camera,

For 25 Subscriptions to The Photographic Times.



8 x 10 Irving Clay Camera,

For 50 Subscriptions to The Photographic Times.

Send in your subscriptions as you receive them and they will be credited to your account.

Each subscription must be accompanied with the cash in payment therefor.

Two half-year or four quarterly subscriptions will count as one year's.

Give full name and address of subscriber. One yearly subscription costs $4.00, half-yearly $2.00, and quarterly $1.00.

The Photographic Times Publishing Association,

60 and 62 East 11th Street, New York.

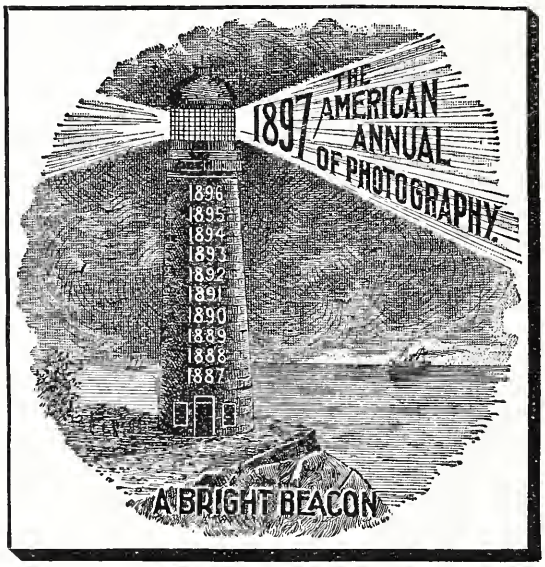
HAVE YOU SECURED A COPY?

The American Annual of Photography and Photographic Times Almanac for 1897 ..

EDITED BY WALTER E. WOODBURY.

70 full-page Illustrations.

300 Pictures in all.



1 Photogravure Frontispiece.
3 Three-Color Pictures.
1 Heliotype Reproduction.
1 Two-Color Print.
16 Inserts Printed in Colors.

ECLIPSES THEM ALL.

A Giant in size, and a veritable storehouse of good things.

Price, in Paper Covers,	$0 75
" Cloth Bound,	1 25
Additional for Postage,	17

FOR SALE BY
The Scovill & Adams Co. of N. Y.
60 and 62 East 11th Street.

The S. & A. Photographic Series.

	Price per copy.
No. 1. The Photographic Amateur. By J. TRAILL TAYLOR. A Guide to the Young Photographer, either Professional or Amateur. (Second Edition.) Paper covers, 50 cents. Cloth bound (Library Edition)...	$0 75
No. 5. Photography with Emulsions. By CAPT. W. DE W. ABNEY, R.E., F.R.S. A treatise on the theory and practical working of Gelatine and Collodion Emulsion Processes. (Second Edition.) Paper covers	75
No. 7. The Modern Practice of Retouching. As practiced by M. Piquepé, and other celebrated experts. (Ninth Edition.) Paper Covers........	50
Cloth bound (Library Edition)........	75
No. 8. The Spanish Edition of How to Make Pictures. Ligeras Lecciones sobre Fotografia Dedicados a Los Aficionados. Cloth bound, 75 cents. Paper covers........	50
No. 12. Hardwich's Photographic Chemistry. A manual of photographic chemistry, theoretical and practical. Ninth Edition. Edited by J. TRAILL TAYLOR. Leatherette binding........	2 00
No. 13. Twelve Elementary Lessons on Silver Printing. (Second Edition.) Paper covers........	50
No. 14. About Photography and Photographers. A series of interesting essays for the studio and study, to which is added European Rambles with a Camera. By H. BADEN PRITCHARD, F.C.S. Paper covers	50
Cloth bound (Library Edition)........	75
No. 15. The Chemical Effect of the Spectrum. By Dr. J. M. EDER. Cloth bound, 50 cents. Paper covers,	25
No. 16. Picture Making by Photography. By H. P. ROBINSON. Author of Pictorial Effect in Photography. Written in popular form and finely illustrated. Library Edition, $1.00. Paper Covers........	75
No. 20. Dry Plate Making for Amateurs. By GEORGE L. SINCLAIR, M.D. Pointed, practical and plain. Leatherette binding........	50
No. 21. The American Annual of Photography and Photographic Times Almanac for 1887. (Second Edition.) Paper cover; (postage, 12 cents additional)........	50
Library Edition; (postage, 12 cents additional)........	1 00
No. 22. Photographic Printing Methods. By the Rev. W. H. BURBANK. A Practical Guide to the Professional and Amateur Worker. Cloth bound. (Third Edition)........	1 00
No. 23. A History of Photography. Written as a practical guide and an introduction to its latest developments. By W. JEROME HARRISON, F.G.S., and containing a frontispiece of the author. Cloth bound........	1 00
No. 24. The American Annual of Photography and Photographic Times Almanac for 1888. Illustrated. (Second Edition.) Paper; (by mail, 12 cents additional.)........	50
Library Edition; (by mail, 12 cents additional)........	1 00
No. 25. The Photographic Negative. A Practical Guide to the Preparation of Sensitive Surfaces by the Calotype, Albumen, Collodion, and Gelatine Processes, on Glass and Paper, with Supplementary Chapter on Development, etc., by the REV. W. H. BURBANK. Cloth bound. Reduced from $1.50 to........	1 00
No. 26. The Photographic Instructor for the Professional and Amateur. Being the comprehensive series of Practical Lessons issued to the Students of the Chautauqua School of Photography. Revised and enlarged. Edited by W. I. LINCOLN ADAMS, with an Appendix by Prof. CHARLES EHRMANN. (Fifth Edition, enlarged and revised.) Paper Covers $1.00. Library Edition........	1 50
No. 27. Letters on Landscape Photography. By H. P. ROBINSON. Finely illustrated from the Author's own photographs and containing a Photogravure Frontispiece of the Author. Cloth bound........	1 50
No. 29. The Processes of Pure Photography. By W. K. BURTON and ANDREW PRINGLE. A standard work, very complete and freely illustrated. Price, in paper covers, $2.00. Library Edition........	2 50
No. 30. Pictorial Effect in Photography. By H. P. ROBINSON. A new edition. Illustrated. Mr. Robinson's first and best work. Cloth bound........	1 50
No. 32. Practical Photo-Micrography. By ANDREW PRINGLE. Fully illustrated. Cloth bound	$2 50

The S. & A. Photographic Series.

(Continued.)

	Price per copy.
No. 33. The American Annual of Photography and Photographic Times Almanac for 1890.	
Paper cover (by mail, 14 cents additional)	50
Library Edition (by mail, 14 cents additional)	1 00
No. 34. The Optical Lantern. Illustrated. By ANDREW PRINGLE. In paper covers	1 00
Cloth bound	1 50
No. 35. Lantern-Slides by Photographic Methods. By ANDREW PRINGLE. In paper covers	75
Cloth bound	1 25
No. 36. The American Annual of Photography and Photographic Times Almanac for 1891.	
Paper cover (by mail, 15 cents additional)	50
Library Edition (by mail, 15 cents additional)	1 00
Cyclopedic Index for 1891 Annual	10
No. 37. Photographic Optics. A Text Book for the Professional and Amateur. By W. K. BURTON. Paper	1 00
Library Edition	1 50
No. 38.—Photographic Reproduction Processes. Illustrated. By P. C. DUCHOCHOIS. Paper	1 00
Cloth	1 50
No. 39. El Instructor Fotografico. Paper covers, $1.00 Library edition	1 50
No. 41. The Chemistry of Photography. By W. JEROME HARRISON. Cloth bound	3 00
No. 42. Picture-Making in the Studio. By H. P. ROBINSON. Paper	50
Cloth bound (Library edition)	1 00
No. 43. The American Annual of Photography and Photographic Times Almanac for 1893.	
In Paper covers. Postage, 15 cents extra	50
Cloth bound (Library edition). Postage 15 cents extra	1 00
No. 44. The Lighting in the Photographic Studio. By P. C. DUCHOCHOIS. A new edition. In paper covers	75
Cloth bound (Library edition)	1 00
No. 45. The Grammar of Photo-Engraving. By H. D. FARQUHAR. Illustrated. The most complete text book yet published on this subject. Price, in paper covers	2 00
Cloth bound (Library edition)	2 50
No. 46. Industrial Photography. Illustrated. By P. C. DUCHOCHOIS. Being a description of the various processes of producing Indestructible Photographic Images on Glass, Porcelain, Metal, and many other substances. Paper Covers, 50 cents. Cloth bound	1 00
No. 47. The American Annual of Photography and Photographic Times Almanac for 1894.	
Edited by W. I. LINCOLN ADAMS. In Paper Covers. Postage, 15 cents extra.	50
Cloth bound (Library Edition). Postage, 15 cents extra	1 00
No. 48. Aristotypes, and How to Make Them. Giving a complete description of the manufacture and treatment of Gelatino and Collodio-Chloride Papers. By WALTER E. WOODBURY. Illustrated. In Paper Covers	1 50
Cloth bound (Library edition)	2 00
No. 49. The Encyclopedic Dictionary of Photography. Containing over 2,000 references and about 400 illustrations. By WALTER E. WOODBURY, Editor of THE PHOTOGRAPHIC TIMES. In press.	
No. 50. The American Annual of Photography and Photographic Times Almanac for 1895. With over 200 illustrations. Edited by WALTER E. WOODBURY, Editor of "The Photographic Times." In Paper Covers. Postage, 15 cents extra	50
Cloth bound (Library Edition)	1 00
No. 51. The Photo-Gravure. By HENRY R. BLANEY. A very complete and practical book, written by an Expert. In paper covers, 50 cents. Cloth bound (Library edition)	1 00
No. 52. The Platinotype: Its Preparation and Manipulation. By Capt. W. DE W. ABNEY & LYONEL CLARK. Fully illustrated. 174 pages	1 25
No. 53. The Annual, '96. "The American Annual of Photography and Photographic Times Almanac for 1896," with 400 illustrations. Edited by WALTER E. WOODBURY, Editor of THE PHOTOGRAPHIC TIMES. In paper cover, 75 cents; in cloth bound	1 25
No. 54. Half-Tone by the Enamel Process. By ROBERT WHITTET. Fully illustrated and very complete. Price, in pape cover, 50 cents. Library edition	1 00
No. 55. Instantaneous Photography. By Capt. Abney, the great authority. Price in paper covers	75

For sale by all dealers in Photographic goods, booksellers, and sent, postpaid, on receipt of price, by the publishers.

No. 56. Photographic Amusements. By WALTER E. WOODBURY, Editor of THE PHOTOGRAPHIC TIMES In paper covers	1 00

THE SCOVILL & ADAMS CO. OF NEW YORK,

60 and 62 East 11th Street, New York.

A Selected List of Books

From the Scovill & Adams Co. of New York Book Catalogue.

	Price per copy
Amateur Photography. A Practical Guide for the Beginner. By W. I. Lincoln Adams. Illustrated. Paper covers, 50c.; cloth bound	$1 00
Lantern Slides and How to Make Them. By A. R. Dresser. A new book, very complete and practical	25
Photography at Night. By P. C. Duchochois. Illustrated. 108 pp. Paper covers	1 00
The Knack. Written expressly to help the beginner in perplexity, reduced to	25
Photographic Lenses; Their Choice and Use. By J. H. Dallmeyer. A special edition, edited for American photographers. In paper covers	25
The Chemistry of Photography. By Prof. Raphael Meldola	2 00
The Photographic Image. By P. C. Duchochois. A Theoretical and Practical Treatise on Development. Paper covers	1 50
Cloth bound	2 00
The Ferrotyper's Guide. For the ferrotyper, this is the only standard work. Seventh thousand	75
The Photographic Studios of Europe By H. Baden Pritchard, F.C.S. Cloth bound, $1.00; paper covers	50
History and Hand-Book of Photography. With seventy illustrations. Cloth bound, reduced to	50
Crayon Portraiture. Complete instructions for making Crayon Portraits on Crayon Paper and on Platinum, Silver and Bromide Enlargements; also directions for the use of Transparent Liquid Water Colors, and for making French Crystals. By J. A. Barhydt. A new edition. Paper covers	
Cloth bound	1 00
Art Recreations. Ladies' popular guide in home decorative work, with a chapter on photography. Edited by Marion Kemble	1 00
American Carbon Manual. For those who want to try the carbon printing process, this work gives the most detailed information. Cloth bound. Reduced to	50
The Photographer's Book of Practical Formulas. Compiled by Dr. W. D. Holmes, Ph.B., and E. P. Griswold. Paper covers, reduced from 75c. to 30c.; cloth bound, reduced from $1.50 to	60
American Hand-Book of the Daguerrotype. By S. D. Humphrey. (Fifth Edition.) This book contains the various processes employed in taking heliographic impressions	25

An Interesting Question.

Why is it that, with one exception, all the firms who advertised in last year's American Annual of Photography have secured space in the 1898 edition now in preparation?

WE GO TO PRESS IN A FEW DAYS.

Applications for space must be made immediately to Managing Editor,

The American Annual of Photography,

60 and 62 East 11th Street, New York.

ARE YOU A SUBSCRIBER

TO THE

St. Louis & Canadian Photographer?

NO?

WELL, YOU ARE BEHIND THE TIMES.

Send 50 Cents at once for a

3 MONTHS' TRIAL TRIP.

EVERY NUMBER HANDSOMELY ILLUSTRATED.

Amateurs like it. Professionals cannot do without it.

"I wish you success in the new Editorship, and hope that the good work of the Journal will go on, and that it will still continue to uphold and build up the legitimate photo business."

C. P. McDANNELL,
Cambridgeboro, Pa.

"Why, of course, we wish to renew. You would not expect us to try and run business without it."

E. LONG & SON,
Quincy, Ill

$3.00 per Year, $1.50 for Six Months.

Mrs. FITZGIBBON-CLARK,

2714 Olive St., ST. LOUIS, MO.

SUBSCRIPTIONS RECEIVED BY ALL DEALERS.

THE

Year Book of Photography and Amateur's Holiday Guide,

PRICE, IN PAPER COVERS, - - - - - $0.50
CLOTH BOUND, - - - - - - - - - 1.00

A limited number only imported : : : : : : : :

Order now, if you want a copy.

The Scovill & Adams Co. of N. Y

"Roentgen Rays" seem to be developing a sense of humor in the German photographic brain. The *Photographisches Wochenblatt* gives the following forecast of professional photography in 1897:

Scene—Photographer's reception room.
Customer—"I should like to be photographed."
Lady Attendant—"An exterior or interior view?"
Customer—"Only the spleen, if you please."
Lady Attendant (through the telephone): "Take one Central interior!! Bile sensitive plate!!!"

Amateur Photography.

"A Practical Guide for the Beginner."

By W. I. LINCOLN ADAMS.

(Illustrated.)

This is a practical treatise for the beginner by one whose experience of, and immediate contact with, the needs of those who are using the camera, in and out of doors, both for pleasure and profit, especially fits him to Help the Beginner.

It will be sent, post-paid, in paper covers on receipt of Fifty Cents.

In handsome Red Cloth Binding, with Gilt Lettering. One Dollar.

Get the Permanent Cloth Binding.

This Book is now in its Third Edition and Sitxh Thousand. You cannot afford to be without it.

THE SCOVILL & ADAMS COMPANY OF N. Y.

50,000 things
worth knowing in

Current Literature.

Edited by
GEO. W. CABLE.

We will send a sample copy free to any address if this advertisement is mentioned; otherwise inclose 25 cents for the current number. $3 a year.

Current Literature, New York.

Learn how to make

Your own Engravings.

THE LATEST BOOK OUT.

Half Tone by the

ENAMEL PROCESS

Tells all about it.

Price, 50 cents, paper cover.

The Scovill & Adams Co. of N. Y.

60 and 62 East 11th St., N. Y. City.

The Practical Process Worker and Photo-Mechanical Printer.

A Representative Monthly Magazine of American Process Work.

Fully Illustrated with Specimens of the Latest Achievements in the Art.

This periodical is conducted by practical men, who give their experience in the laboratory and workshop, not by mere theorists.

Subscription price per annum, 50 cents.
Single Copies, - - - 5 "

ADVERTISING RATES ON APPLICATION.

Edited by WALTER E. WOODBURY.
A. C. LAMOUTTE, Business Manager.

PUBLISHED BY The Scovill & Adams Co. of N. Y.,

60 & 62 East 11th Street, New York.

First Edition Sold Out within a few weeks.

SECOND EDITION NOW READY.

"Photographic Amusements"

By WALTER E. WOODBURY,
Editor of "THE PHOTOGRAPHIC TIMES."
AND "THE AMERICAN ANNUAL OF PHOTOGRAPHY."

Containing a Description of

A Number of Photographic Experiments and Novel Effects to be obtained with the Camera.

Invaluable to both the Amateur and Professional Photographer.

CONTENTS.

The Mirror and the Camera.
The Photo-Anamorphosis.
Statuette Portraits.
Magic Photographs.
Spirit Photography.
Photography for Household Decoration.
Leaf Prints.
To Make a Pen and Ink Sketch from a Photograph.
Photographs on Silk.
Photographs on Various Fabrics.
Photographs in any Color.
How to Copy Drawings.
Dry-Plates that Will Develop with Water.
Photographing the Invisible.
How to Make Photographs in a Bottle.
Caricature Photographs.
Photographing a Catastrophe.
Sympathetic Photographs.
Wide-Angle Studies.
Silhouettes.
Freak Pictures with a Black Background.
Freak Pictures by Successive Exposures.
Photographing Snow and Ice Crystals.
Photographing Ink Crystals.
Photographing Sea Weed.
Stamp Portraits.
Moonlight Pictures.
Floral Photography.
A Simple Method of Enlarging.
Distorted Images.
Luminous Photographs.
Photographs Without Light.
Electric Photographs.
Pinhole Photography.
Magic Vignettes.
Instantaneous Photography.
Photographing Fireworks.
Lightning Pictures.
The Photochromoscope.
Composite Photography.
Double Exposure Pictures.
Tele-photographs.
Artificial Mirages.
Etc., etc., etc.

OVER ONE HUNDRED ILLUSTRATIONS.

Price, in Paper Covers, $1.00. Cloth, $1.50.

Sent post-paid on receipt of price by the Publishers,

THE SCOVILL & ADAMS COMPANY OF NEW YORK,
60 and 62 East Eleventh St., New York, N. Y.

SEND FOR NEW CATALOGUE OF PHOTOGRAPHIC PUBLICATIONS.

SUBSCRIPTION FORM.

THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION,
60 and 62 East 11th Street, New York,

Gentlemen: Please send THE PHOTOGRAPHIC TIMES

for........................ year, commencing........................189 , for which

I enclose........................dollars.

Name........................

Address........................

....

The Leading Photographic Magazine of the World.

TERMS CASH.—To avoid all risks, we prefer remittances by Express, Money Orders, Draft on New York, Post Office Money Orders, Postal Notes, or Registered Letter.

WILSON'S PHOTOGRAPHIC PUBLICATIONS.

WILSON'S PHOTOGRAPHIC MAGAZINE

A monthly technical journal for all interested in photography and its applications. Full of practical information, reliable formulæ, news of recent methods and processes. Brightly written and profusely illustrated. Independent and progressive in opinion. Price, Three Dollars per year; 1.50 for six months. Sample copy, 10c.

WILSON'S QUARTER CENTURY IN PHOTOGRAPHY. (Sixth Thousand.)

A complete text-book of the art, science and practice of photography and modern photographic processes. The departments given to lenses, studio construction, negative making and printing, are especially valuable. 528 pages; profusely illustrated; with index. Price, $4.00, postage paid. Contents list free.

WILSON'S CYCLOPÆDIC PHOTOGRAPHY. (Third Thousand.)

A universal photographic reference book, giving concise and reliable information upon all photographic subjects from the beginning down to date. 500 pages. Price, $4.00 postpaid. Send for special circular.

WILSON'S PHOTOGRAPHICS. (Ninth Thousand.)

This work, of which 8,000 copies have been sold, contains chapters upon every department of photographic practice, and includes a complete manual of the wet collodion process, as well as the "dry." Fully illustrated. Indispensable to photo-mechanical process-workers. 350 pages. Price, $4.00, postpaid. Detailed contents list free.

WILKINSON'S PHOTO-ENGRAVING, PHOTO-ETCHING Etc.

The standard work on photo-mechanical methods; gives full instructions and formulæ, the equipment of the photographic department, process photography, etc. 180 pages; index. Price, $3.00, prepaid. Detailed contents list free.

PHOTOGRAPHIC MOSAICS 1897.

An illustrated annual record of photographic progress. Thirty-third year. Profusely illustrated Send for detailed contents list. Ready December 1, 1896.

EDWARD L. WILSON, 853 BROADWAY, NEW YORK.

THE ENCYCLOPAEDIC DICTIONARY OF PHOTOGRAPHY

which is continued in this issue, was commenced in the number for January, 1896, vol. xxviii, bound in cloth, and contains the encyclopædia up to date. Will be sent on receipt of Five dollars by

The Photographic Times Publishing Association,
60 and 62 East 11th St., New York.

EVERY GOOD PHOTOGRAPHER

Delights in good printing. Send for a copy of *The Printer and Bookmaker*, a journal devoted to Printing, Engraving, Illustrating, Bookmaking, Etc. It is pleasing to the eye, and instructive to the mind.

SUBSCRIPTION PRICE, $2.00 PER YEAR.

HOWARD LOCKWOOD & CO.,
143 Bleecker Street, New York.

UNDER NEW MANAGEMENT.

ROMANCE

20 ROMANTIC STORIES FOR 10c.

MORE READING MATTER THAN ANY OTHER MAGAZINE IN THE WORLD.

A LIBRARY IN ITSELF.

Romances of Love and War, Romances of Real Life, Stories of Gallantry, Tales of Adventure, Stories of the Boudoir.

BEST KNOWN AUTHORS AND UNKNOWN AUTHORS.

SUBSCRIPTION $1.00 A YEAR

OR,

Romance and any $1.00 a year Magazine, $1.50.

EXTRAORDINARY PRICES OFFERS.

Bicycles given away. Particulars and Sample Copies Free.

GILSON WILLETS, Editor and Publisher,
1440 Broadway, New York.

The Month

In Literature, Art and Life Illustrated

A Journal of Cultivation

JOSEPH B. GILDER & JEANNETTE L. GILDER, Editors.

I thank you very cordially for your kindness in sending me the first number of your new publication THE MONTH. I have read the number through with the deepest interest. It is bright, fresh, original, and has the power of compelling one to read it. If only you go on like that you are sure, according to my not wholly inexperienced judgment, to succeed, and I sincerely wish for your complete success.

JUSTIN McCARTHY.

London, *January 22, 1897.*

THE CRITIC CO., 287 Fourth Ave., N. Y.

Read "Electricity,"

The Only Independent Electrical Journal
PUBLISHED IN THE UNITED STATES.

ALL THE ELECTRICAL and FINANCIAL NEWS.

Latest Technical Articles by Home and Foreign Writers.

THE BEST ADVERTISING MEDIUM.

Published Weekly.
Subscription $2.50 per year. Address,

ELECTRICITY NEWSPAPER CO.,
136 Liberty St., New York.

DON'T BE "A BUTTON PRESSER,"

for he is a poor specimen of humanity who is contented to press the button, let others do the rest, and then claim the result as his own. To become a successful Photographer you must read this Magazine.

Have it sent to your address regularly.

More than 100 Prizes

WILL BE GIVEN BY THE PUBLISHERS OF

GAMELAND

to those persons who send them, prior to September 15th, 1897, the largest lists of words formed from the letters contained in the title of their magazine, GAMELAND. The prizes include

BICYCLES, GUNS, CAMERAS, MUSICAL INSTRUMENTS,

AND OTHER DESIRABLE ARTICLES.

Every Contestant Will Receive a Prize.

Send to-day for a FREE SAMPLE COPY OF GAMELAND, which contains full particulars of the contest.

Address,

Gameland Publishing Company,
INCORPORATED,
63 RUTGERS SLIP, NEW YORK, N. Y.

INTERESTED IN ELECTRICITY?

Read The Electrical Engineer.

Published Weekly. Fully Illustrated. Convenient in Size.

ALL THE NEWS.

A series of important articles on the Storage Battery is now running in our pages.

Electrical Engineering Leaflets.

An educational electrical work in three volumes—elementary, intermediate, and advanced grades. $1.50 each.

THE ELECTRICAL ENGINEER,

SEND FOR BOOK CATALOGUE. **120 Liberty St., New York.**

A List of — Wide-awake · Firms

Who have already engaged space in the 1898 Annual.

A. M. COLLINS MFG. CO.
WILLIS & CLEMENTS.
E. & H. T. ANTHONY & CO.
WUESTNER'S EAGLE DRY PLATE CO.
AMERICAN ARISTOTYPE CO.
VIVE CAMERA CO.
EMPIRE PHOTO PAPER CO.
M. WOLF.
SCHERING & GLATZ.
McDONALD & LOVEJOY.

MANHATTAN OPTICAL CO.
MAX LEVY.
ALBEMARLE PAPER CO.
C. B. GOERZ.
BUTTS & ADAMS.
G. GENNERT.
GUNDLACH OPTICAL CO.
HUGH MORRISON & SONS.
CHAS. COOPER & CO.
NEPERA CHEMICAL CO.

ACTIEN-GESELLSCHAFT FUR ANILIN-FABRIKATION.

WOODARD, CLARK & CO.
J. ROYLE & SONS.
GEO. H. BENEDICT.
FERDINAND FLINSCH.
BLANCHET FRERES.
MISSOURI PACIFIC RAILWAY.
CARTER'S INK CO.
PROSCH MFG. CO.
JOHN CARBUTT.
G. CRAMER DRY PLATE WORKS.
DAUBARN & WARD.
BAUSCH & LOMB OPTICAL CO.
G. R. BOXWOOD MFG. CO.
STEINBACH & CO.
PAUL PUTTMANN.
ROCHESTER OPTICAL CO.

HAMMER DRY PLATE CO.
PAUL SCHNIEDEWEND & CO.
J. B. COLT & CO.
OBRIG CRMERA CO.
LOVELL DRY PLATE CO.
ROSS & CO.
J. C. MILLEN.
E. LONG & SON.
IRON COTTAGE CO.
GEO. MURPHY.
AUTOCOPYIST CO.
HULBERT BAS RELIEF CO.
L. SOLLMANN.
ACME WATER COLOR CO.
AIR BRUSH MFG. CO.
M. A. SEED DRY PLATE CO.

Are you asleep?

Application for Space must be made immediately to the Managing Editor,

The American Annual of Photography,
60 and 62 East 11th Street, NEW YORK.

DON'T BE
"A BUTTON PRESSER,"
for he is a poor specimen of humanity who is contented to press the button, let others do the rest, and then claim the results as his own. To become a successful Photographer you must read
THE PHOTOGRAPHIC TIMES,
60 and 62 East 11th St., New York City.
Send 35 cents for a sample number, containing a beautiful photogravure frontispiece and from 50 to 100 illustrations, including reproductions of the works of the principal amateur and professional photographers of the world.

MISSOURI PACIFIC RAILWAY
THE FAST MAIL ROUTE
ST. LOUIS TO KANSAS CITY
AND THE
WEST
HOURS SAVED TO SOUTHWEST MISSOURI AND KANSAS POINTS
WITH DIRECT CONNECTIONS FOR
COLORADO AND PACIFIC COAST POINTS
"THE COLORADO SHORT LINE"
C. G. WARNER, Vice-Pres't
W. B. DODDRIDGE, General Manager
H. C. TOWNSEND, Gen'l Pass'r and Ticket Agent
St. Louis Mo

Mr. Alfred Stieglitz writes, in regard to the Goerz-Double-Anastigmats:

Dear Mr. Goerz: Some time ago I promised to give you a report on my experience with your lens. Not wishing to give my opinion without a conscientious test, you have not heard from me sooner.

After a continued use of two of your lenses (one a 12-in. and the other a 7-in.) for about two years, it is with great pleasure that I am enabled to say that they have far surpassed your claims and also my expectations.

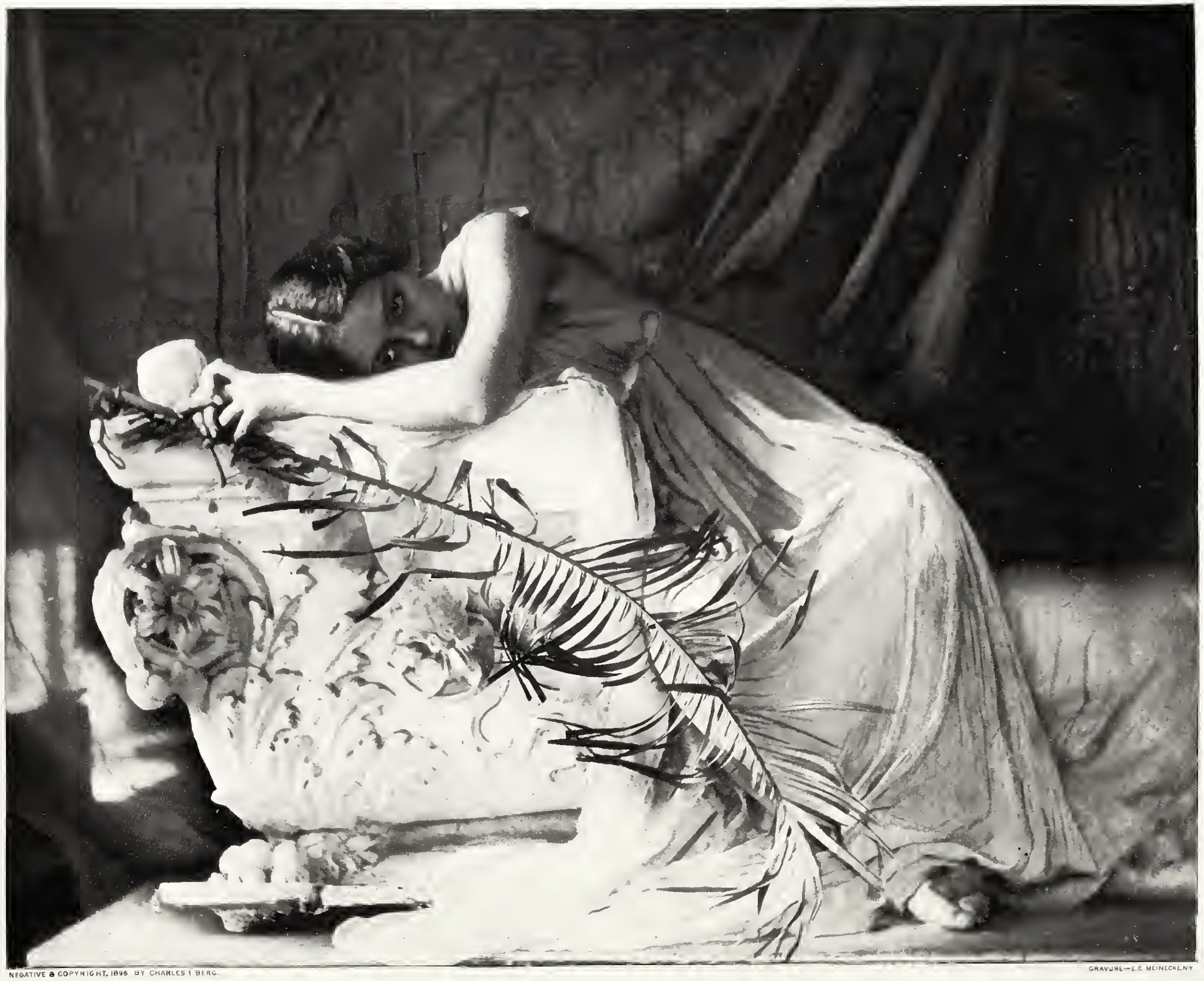
Some of the results obtained with them were nigh impossible heretofore. The covering power and speed of the lenses with full opening are not approached by any other lens that may have passed through my hands.

For all-around hand camera work they are certainly without equal, and it is in this special branch of photography that I have given them the severest test, with such surprising results.

At my earliest opportunity I shall be pleased to send you a few samples of the work.

Photographic Everything
NEW STORE—Convenient
NEW STOCK—Complete
NEW PRICES—Lowest
NEW IDEAS from everywhere
NEW APPARATUS of all makers
NEW SUPPLIES of old staples
The Scovill & Adams Co. of New York
Nos. 60 and 62 East 11th St.
(Five doors from B'way)
Send 35 cents for a sample number of The Photographic Times, containing about 100 handsome photographic illustrations.

Cameras and Cash
We've got the Cameras and want the cash. Photo supplies of all sorts and of all makers
Complete Photographic Library (56 instruction books covering the entire field of photography.) New Store—convenient. :: :: :: :: :: ::
Prices that render the goods Prizes
The Scovill & Adams Co. of New York
Nos. 60 and 62 East 11th St.
(Five doors from B'way)
Send 35 cents for a sample number of The Photographic Times containing about 100 handsome photographic illustrations.



NEGATIVE & COPYRIGHT, 1898 BY CHARLES I BERG.

GRAVURE—E.C. MEINECKE, N.Y.

"REQUIESCAT IN PACE"

THE PHOTOGRAPHIC TIMES.

Vol. XXIX. OCTOBER, 1897. No. 10.

AN ADAPTATION OF TELESCOPE LENSES FOR PHOTOGRAPHY.

BY HENRY SKILLMAN CURTIS.

Copyright, 1897, by Otto Sarony.

GRACE KIMBALL. By SARONY.

IN the old days of wet plates and slow and laborious processes, picturetaking was beset with so many difficulties, that those who took up the pursuit for their own pleasure were few and far between. But such a condition of affairs had this one crowning advantage. A man was obliged to do his own work, and in order to accomplish this, he must, in the first place, as a student, understand the science of his pursuit. Frequently thrown on his own resources, one who did not comprehend the principles of his apparatus, the difficulties to be encountered, nor how to meet and overcome them, could not hope to succeed.

Consequently there was a constant stimulus to further study and research and the improvement of apparatus. To-day, with the removal of difficulties and drawbacks in picture taking, much of the old enthusiasm for investigation appears to have died out, among the amateurs, at least.

For this reason, it would seem that anything in the way of experiment, or departure from the regular lines laid down by the professional, should be encouraged in every way possible. In the hope that some of those who are fond of such experimental work may be interested in the adaptation of lenses for different uses, the following paper has been written.

The difference between a telescope lens and a photographic lens, lies chiefly in the degree of correction for chromatic and spherical aberration. The former is ground to give an image free from visible aberration, and of extreme sharpness, capable of being magnified by an eyepiece. The field, however, is somewhat curved, so that only a small portion can be in the focal plane of the eyepiece at one time. A glance at Fig. 1 will explain this more clearly.

Let A represent the telescope objective, the convex crown glass (a) and the concave flint glass (b), being placed as indicated, the usual position in lenses of this type. Also let B represent any distant object. An image of B will then be formed at the point C, but will be curved somewhat as indicated, only the middle portion being available for observation by the eyepiece D. The field, therefore, of such a lens is limited, but as astronomical objects are usually small, their images in the telescope rarely exceed the limits of clear definition. If, however, the image is of considerable area, it is evident that it cannot be focused sharply on a plate at C, for, if the center be in focus, the edges will be blurred, and *vice versa*. In photographic parlance, "the field is not flat."

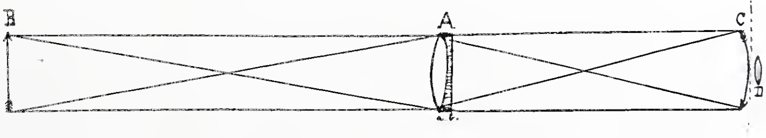


FIG. 1.

A few years ago it was the writer's good fortune to come into the possession of a fine telescope lens, two inches in diameter, and thirty-six inches in focal length. The flint and the crown glasses were not cemented together, but were detached, thus inviting ex-

Copyright, 1896, by The Scovill & Adams Co. of New York. Entered as Second Class Matter at the New York, N. Y., Post Office.

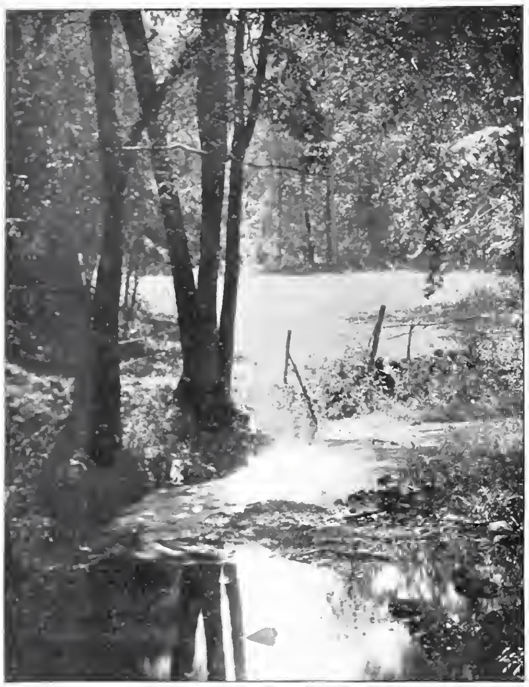


FIG. 3.

periment. In the course of a research on certain properties of lenses, under the direction of Professor Rood of Columbia, it occurred to me to try how good a photograph such a lens would make.

It already had been ascertained that, if the concave lens were placed in front of the convex lens, the area of sharp focus in the image would be much increased. The objective was set up in this manner, and a picture taken, but without any expectations of clear, sharp results, as I had labored always under the mistaken impression, so common to amateurs, that good results could be obtained only by the use of fine and expensive apparatus. The results, however, were so satisfactory, that it seemed worth while to follow the matter up. A series of experiments followed, the outcome of which has been a good deal of valuable knowledge concerning lenses and their ways, and the addition of an excellent photographic objective to the writer's outfit.

To sum up the matter, it was found that the defects of curvature could be effectively corrected by changing the relative position and distance apart of the components of the objective. A reference to Fig. 2 will show how this may be done. Let the same letters represent similar objects as before.

The concave lens (b) is placed in front of the convex lens (a), the concave surface turned outward The rays of light coming from the object B are bent outward, and made more converging, and this in turn tends to bend back the edges of the field and render it more flat.

When a telescope objective is to be used for photographic purposes, it is necessary also to alter the correction from that of visual to that of actinic rays. This is accomplished in the case of large glasses, by adding a secondary convex lens of crown glass This slightly counteracts the action of the flint lens, rendering the objective under-compensated for visual, but correctly adjusted for photographic purposes. The use of an additional lens is unnecessary for the correction of small glasses and for such purposes as an amateur would wish to accomplish. The desired result is obtained by the degree of separation of the flint and crown glasses.

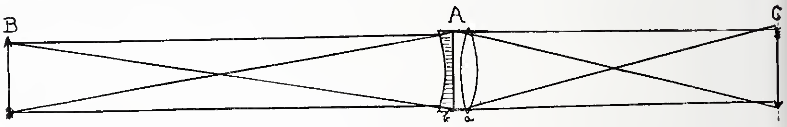


FIG. 2.

The correcting power of the concave lens decreases the further it is removed from the convex lens. Consequently a point can be found where the former will act as a corrector for the actinic or chemical rays. This point can be determined readily by experiment. In the adjustment of the objective described above, about one millimeter, or one twenty-fifth of an

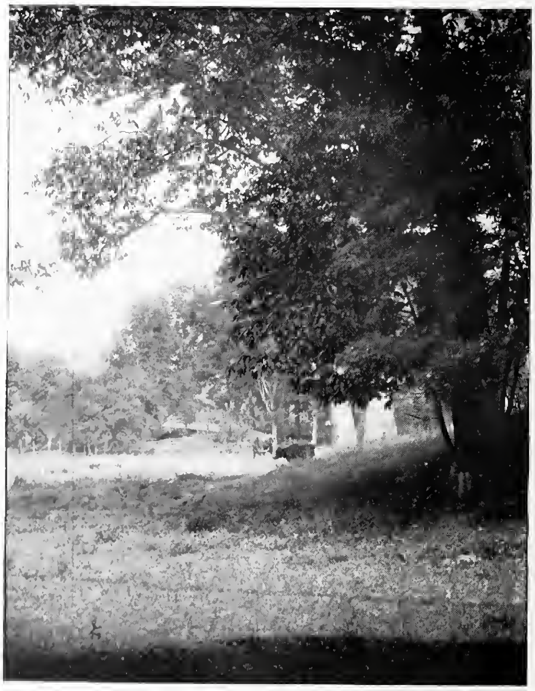


FIG. 4.

inch, was found to be the right distance apart of the components.

A working aperture of slightly more than one-half the diameter of the lens, was the largest that could be used. This, however, was sufficient for instantaneous work, while with a smaller stop the definition was perfect. An 8 x 10 plate was covered without difficulty, while with small stops larger sizes could be used. With lenses of comparatively short focus, the greater curvature of the surfaces causes a decrease in defining power, and smaller plates and stops must be employed.

In many instances the components of telescope and spyglass lenses are cemented together by means of Canada balsam. Separation can be effected by soaking the objective in warm alcohol. This operation had better be performed by an optician, as there is much danger, both from the alcohol exploding while it is being warmed, and the risk of cracking and ruining the lens.

The two pictures which accompany this article were taken with the objective above mentioned, and give some idea of the effects that can be obtained by such means.

There is certainly a great fascination in working with apparatus that has been planned and adjusted by oneself, and the amount of pleasure and information thus obtained is surprising.

ENLARGEMENTS BY AMATEURS.

BY R. R. BOURLAND.

One branch of the beautiful art-science—photography—which is within comparatively easy reach of the amateur, is not made as much of as it deserves to be, both for its possibility of pleasure-giving power and in its opening a way for economy. It is the process of enlargement, a process greatly abused in a professional way by the production of a mass of very displeasing portraits spoiled by the misapplication of crayon or brush in the hands of unskilful workmen, catering to the trade of people whose taste has been spoiled by the blandishments of salesmen who " talk-up " pictures in gaudy frames, the portraits being mostly hard and stiff lines worked up on a basis of the bromide enlargement and ruined in the working up. This is not the kind of work to which I refer, but I do refer to the production of large photographs, choice views, landscapes, for ornamental and decorative purposes, which show the taste and skill of the *artist*.

There are many negatives of only 31/4 x 41/4" or 4 x 5 inches in size, each of which has the complete germ of a landscape, good perspective, correct light and shade, proper composition, with detail so perfect that the loss of its fine definition through the process of enlargement only gives an artistic softness to the enlarged picture. Such a picture properly matted and framed makes a gift which is worthy both the art of the giver and the thanks of the recipient. The economical feature is found in this: (*i. e.*), there is a tendency on the part of the amateur to desire a camera larger than the usual "4 x 5"; his ambition reaches out to the 8 x 10 size, of plate and print, while in all ways the use of an 8 x 10 view camera by an amateur is an expensive luxury. New trays, larger quantities of chemicals, paper, become a large item of expense, card mounts also, and the result (possibly a good one) is the production of fewer pictures, there is less experimenting and many desired views are not taken, but when the 4 x 5 camera is used, about eight times as many negatives can be produced at the same expense, and of these the *choice* can be used to make enlargements from, thus in the case of all desirable views, the 8 x 10 size may be reached by a less expensive road, and the size is by no means one limited to 8 x 10 but is at the pleasure of the operator.

Again the enlargement may be made from the choice part of the negative, the undesirable edge or corner may be left out or the proportion of the composition changed, a weak negative may be made to produce a strong print by proper exposure and development of the enlarged picture.

A peculiar fact also I have noticed, to wit:—that in a properly illuminated, focused, exposed and developed enlargement the perspective of the picture seems to be improved, there is a sort of stereoscopic effect, such as is obtained by looking at a print through a good reading glass and all objects in the distance seem to be much brought out, as in viewing a scene through a telescope.

These are the main points and I will say as to the details that there is great pleasure in making the enlargements, the learning how is a pleasant process. The first requisite is the enlarging lantern, simply a "magic lantern" adapted to the work; this is for night work.

PORTRAIT OF MY WIFE BY LEE FERGUSON

Sunlight can be used, with only the objective of the lantern, by those who can find time to work at it in day-time; here can be saved the expense of "condensers," which are necessary only in connection with artificial light. I have a pair of 8" condensers, 6" will do for 4x5 negatives, 8" glasses will answer for *almost* all of a 5x7 negative. I find my Zeiss anastigmat lens (No. 4, series 4) to be an excellent objective to use with these condensers and to produce good illumination and definition of a 4x5 enlarged to 12 x 15.

The process is simply to place the negative in the enlarging lantern, as if the negative were a lantern slide, and to project the image in the dark on to the sensitized paper as if it were the screen, the focusing is, of course, done on unsensitized paper substituted with the sensitized paper when all is ready for the exposure. The length of exposure is determined by experiment with "test" pieces, and the development is best done strictly in following the directions given with the particular paper used.

The steel engraving effect produced on the best "platino-bromide" papers of the present day is astonishing to the workers and to the friends who receive the finished pictures. Many such an one ornaments the walls of well furnished rooms, and they do not suffer in comparison with good engravings, with the added charm of local and personal interest.

It is impossible to illustrate by pictures the points of this article as the size of the page does not admit of the production of the enlargement, hence only the original negative effect could be here shown, but surely it can be seen without illustration, that the scope of the work of the amateur is greatly broadened by the use of this process.

Not the least benefit to be realized is the effect on the photographic exhibitions. The small size of the average amateur picture makes an exhibition of the originals rather unsatisfactory; it takes too many such to fill any reasonable amount of space, but the many gems which really exist among the "4 x 5's" call for some adequate way of exhibiting them, and no way is so satisfactory as this method. It offers the opportunity of making the finished picture of a reasonable size for wall exhibition, without resorting to professional aid and also offers great opportunity for "working-up" the print by skillful exposure and development of the print as well as in the original negative.

The fullest instructions for making enlargements will be found in the files of the TIMES and the ANNUAL or may be obtained from the manufacturers of any of the bromide papers.

Beggar: Can you help a poor man to—

Pedestrian: I think you have touched me before.

"Possibly, sir; possibly. You see I'm a stranded photographer, and the old habit of retouching clings, sir."—*Philadelphia Record.*

ON THE SOUTH SIDE. BY H. G. ROGERS.

PART II.

The discussion of the best means to keep out the sun's direct rays and at the same time to permit the incoming of sufficient diffused light, will be carried out in this paper, the first paper having been devoted to an introduction of the subject, *i.e.*, the possibility of using a south light in portraiture.

When I first leased my studio, I confess to having felt certain misgivings as to the ultimate result ; the light was harsh, the first few negatives the incarnation of *chalkiness*, the shadows utterly wanting in smoothness and limpidity, and this with the direct sunlight carefully filtered through white sheeting. On cloudy days, the light was most satisfactory, for the large open space in front of my windows gave a quality to it that is only to be obtained at rare intervals with a clear northern exposure. I do not know how it may be explained, but on such days there seemed to be a body of diffused light coming from the sky which did not possess the quality possessed by that which comes from the northern portion of the sky. The latter is of course a reflected light and is always blue on cloudless days, while it ranges from white to dark gray (if I may be allowed to use these terms,) on days when that part of the sky is covered with clouds. The quality which my light had, was most actinic, besides giving me the softest effects and the deepest shadows with half-tones which would satisfy the most difficult taste.

I set to work to "manufacture" a light possessing the qualities found on cloudy days, for unfortunately a New York winter as a general rule abounds in sunshine. Of course, not having a "top light" I was forced to graduate my incoming light from the upper part of the windows down to the lower part, so that I should get more light above than nearer the floor. There was necessarily no question as to screening the direct rays of the sun, the question was, what was the best medium? I tried different material, such as cheese cloth, cambric, sheeting, window-screen cloth, and ran through the gamut of different colors, such as light yellow, dark blue, red, green, etc.

Given a large area of glass, the most advantageous method of procedure I found to be as follows : First, obtain the required amount of "paper cambric" and stitch it together longitudinally if the windows are very wide ; then dye the material with brown aniline dye. The amount of pigment is a matter of experiment on account of the fact that the cambric varies in thickness ; when dyed, the material should be of a light brown or ochre color, and of the correct transparency, should only just prevent the sunlight from being noticeable on the face of the sitter. The solution may be placed in a very large shallow vessel and the cambric drawn through slowly and evenly.

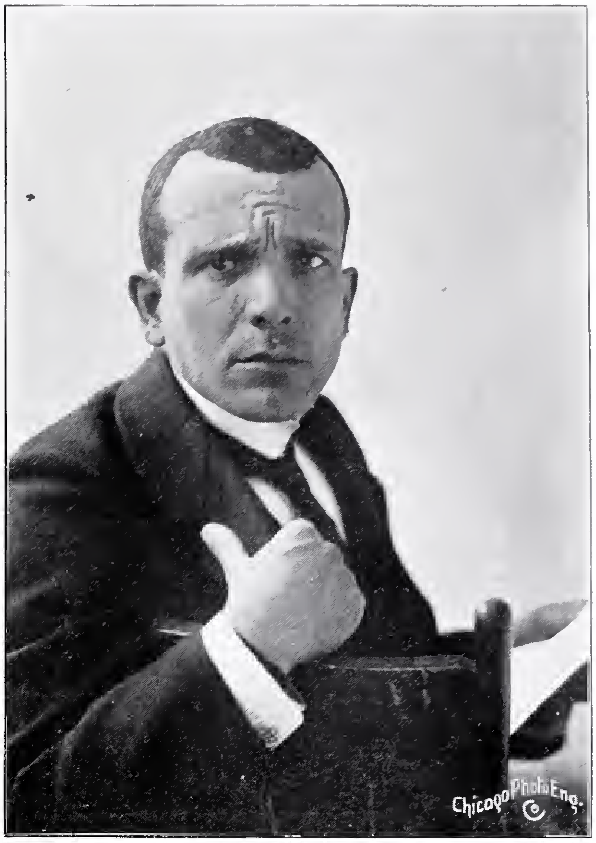

Chicago Photo Eng.

FIG. I.

Care should be taken because the solution is apt to color the material unevenly. The latter may now be put on to rollers used for window screens and located so that it may be drawn up over the windows. These screens are of course only to be used during the sunlight and during the hours when the rays strike the interior of the room. It will be necessary to possess two thicknesses of screen for the lower portions of the windows, while the upper portions require but one thickness; but the auxiliary screen should be white. I need scarcely refer to the days when there is no sunlight and when very thin screens of cheese cloth may be used; as to the color of the cheese cloth, my experience points to orange as the best, but the individual taste of the operator should be consulted, for the difference between the light filtered through yellow to that filtered through blue is very great, the former requiring some practice before it can be used at all. The results, however, vary widely, the former giving transparency in the shadows and soft high lights which are extremely artistic. The length of exposure should also be attended to, as over exposure simply nullifies the effect of the yellow screen. In my own practice I prefer to use screens about four feet high and six feet long; screens that are so constructed that they will stand alone on any part of the floor. By combining the latter with yellow *window* screens, I am enabled to obtain a great many different effects, utterly impossible with ordinary screens attached to the windows or fixed in one position. The advantages of a yellow light are quickly noticed when a negative is taken of a person having many freckles, the latter being to a great extent absent, and the contrary being the case when a blue light is used.

As to reflecting screens to be placed on the "shadow side" of the sitter's face there is little to be said; if they are to be used to relieve the shadow the operator had best do without them.

Should a larger amount of top light be desired it may easily be obtained by constructing a semi-cylindrical screen of white paper or white glossy fabric of the same length as that of the side light, and locating it permanently along the ceiling in such a way that it will receive as much light as possible from the upper part of the windows and reflect it downwards.

I am not advocating a southern exposure when the photographer is to make hard negatives; in that case by all means use a north light, develop with pyro, and adopt as a thermometer of your work the face of your retoucher, for the more contented and happy *he* is, the more will your negatives possess the qualities of patchiness! Should your artistic soul hunger for soft and harmonious effects, try a southern exposure, adopt yellow screens, time the exposure for the shadows, and develop with the following:

SOLUTION A.

Metol	¼ ounce
Hydroquinone	¼ ounce
Water	40 ounces

Dissolve; after which add

Soda sulphite, granulated	2 ounces

SOLUTION B.

Soda carbonate, dried	1 ounce
Soda sulphite	1 ounce
Water	10 ounces

To develop, use 2 ounces of A, 2 drachms of B, 6 ounces of water.

Don't omit to call for fresh emulsion plates. Don't omit to stop development at the right time. Don't omit to wash the negatives well before they go to the hypo trough.

LANDSCAPE PHOTOGRAPHY. BY H. C. DELERY.

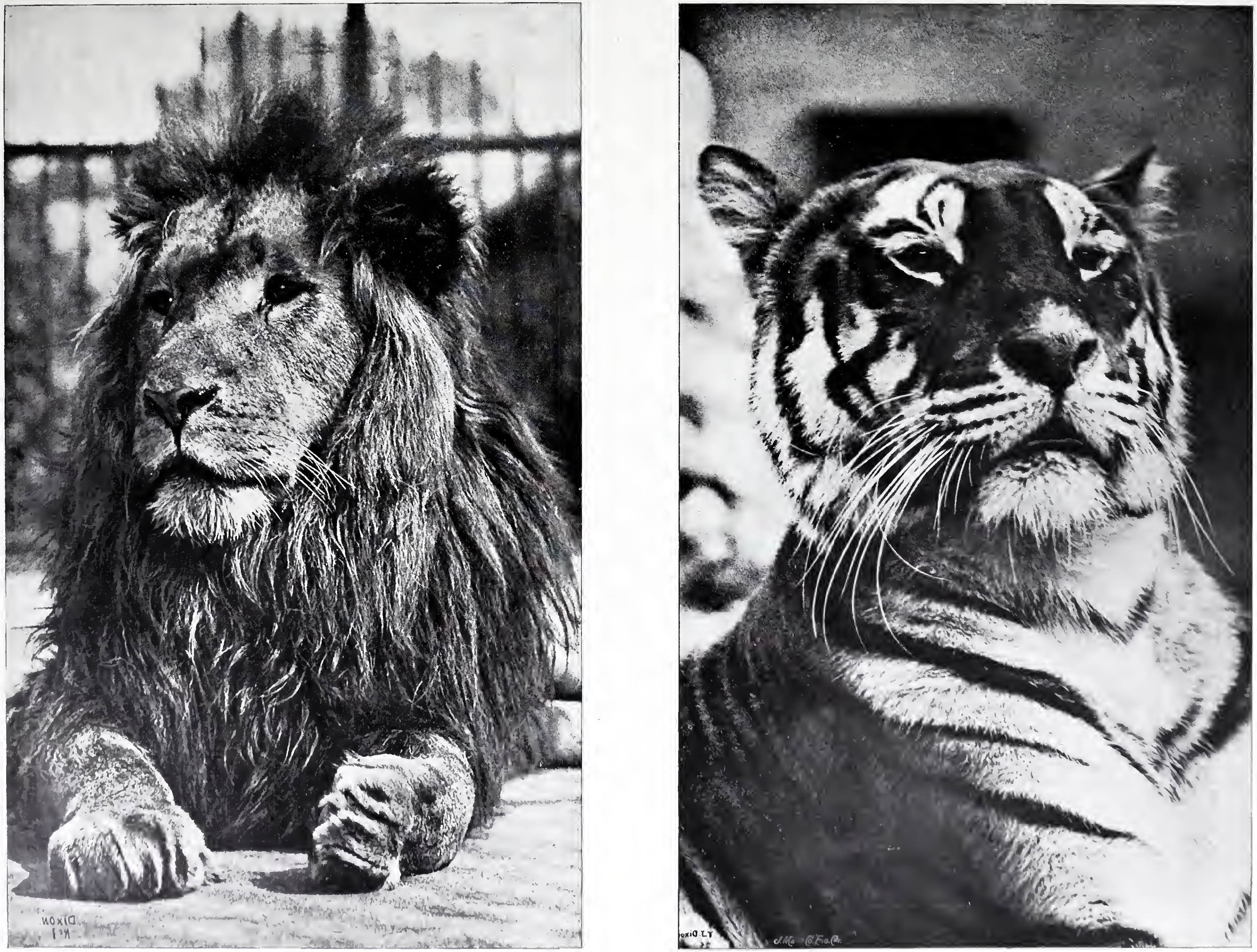
The greatest benefit photography has conferred on man is the power it has given him to reproduce nature, and there is no branch of the art which affords such possibilities, such diversity of subjects, and one in which the true artist may find a never-ending source of enjoyment. Indeed there is no lack of food for the camera, if one only searches for it, and the quest will not be a difficult one.

But there are some jealous or narrow-minded critics, who still cling to the old idea that photography is not art, rather a sort of combination of chemicals and mechanical instruments; but, let us remind the artist, that true art does not consist in the knowing how to apply colors; that it is the motive or feeling expressed in the picture which tells, and the camera and chemicals are to the photographer that which the paint and brush are to the artist; and the application of these is of a secondary nature, and no matter how proficient either may have become in their use, success will never be attained unless they possess the feeling of love of the beautiful in nature. But this feeling cannot be attained by reading or writing; to study the works of the acknowledged art masters will help some; yet, remember, art is a natural gift, not an acquired feeling.

Let everyone follow his own ideas, and if he can produce a picture which the art world will appreciate and never cease admiring, then let him be content.

Aim at individuality and do not do a thing just because some one else has done so, and always remember a picture must have unity and harmony of parts with the whole in order to become a truly beautiful landscape.

The first thing which should occupy our attention in landscape photography is composition The relation of one line to another. One principal feature should predominate, and to this converging lines should imperceptibly lead the eye and around this point, and in a way more or less connected, all other objects should



ANIMAL STUDIES. BY HENRY DIXON, SONS.

ALLEGRO BY J. WELLS CHAMPNEY

be grouped in a subordinate manner. Yet the main feature should not be centrally located in the picture, better in the foreground and a little to one side. The shadows also require special study; how they fall and how they contrast with the brighter lights, and how much gradation is expressed in their depths. Aim at concentration of lights and shadows, and avoid having them scattered all over the picture. Breadth and unity of effect are beauties to be sought for in a landscape.

The foreground owing to its prominence will require careful consideration. It should be bold, irregular, and include something which will lead the attention to the principal subject, and here the artist will show his skill by placing anything that can appropriately be introduced in the picture, such as rock, trees, or even figures. Of the propriety of introducing figures in landscape there still remains a divided opinion. But this may be certain: everything depends on the nature of the subject being treated. In some pictures figures are a necessity to give them life and finish, whilst in others, they would mar their beauty and artistic effect. However, if any are introduced they should be in perfect harmony with the subject, both as regards pose, dress, and other conditions, and should be made to occupy a minor position so as not to detract from the main purport of the landscape.

Another important feature is the sky. The position of the horizon is best determined by the treatment of the subject at hand, but may be generally accepted to be about one-third from the bottom of the picture. And the sky should help the foreground in direction and general lines of the landscape.

Clouds are sometimes very difficult to retain, owing to the prolonged exposure required for the foreground; then certain makeshifts must be resorted to, such as restraining the sky in development, or making two exposures, one for the landscape proper and one for the sky. A white or blank sky never looks well, and as clouds are not always to be had when the picture is being taken, the artist should possess a number of cloud negatives for cases of emergency, yet it is best not to make a rule of this procedure, but rather wait if possible for more favorable conditions when clouds can be taken in the picture, thereby giving more realistic effects.

When the artist starts afield, he should remember the old saying, "What is worth doing at all, is worth doing well"; and if a good subject is found, first study it thoroughly, and when everything has been carefully considered, make the exposure. Nor should he stop here; after the print is taken from the developed plate, changes will often suggest themselves, and a second or more exposure may make decided improvements. Retouching the negative, though strenuously objected to by some, is perfectly permissble and legitimate; this gives the photographer an opportunity to overcome the many difficulties which his brother artist, the painter, does not have to contend with. A shadow may be lightened, a high light softened, a new feature added, and in general a harmonious picture made from what might have been a dismal failure.

In focusing, a certain amount of sharpness in the foreground is permissible, and rather should be sought for, but we must be careful not to allow this sharpness to extend over all the picture, the result of which would be to give it a map-like appearance. On the other hand, excessive fuzziness should not be tolerated under any circumstance. Different seasons of the year and different times of the day produce different atmospheric effects, yet each and all may have its particular charm.

And now a word or two about the apparatus. Expensive and elaborate instruments are not a necessity. A plain, common sense camera, one which can stand hard knocks and usage in all sorts of weather, is the most desirable kind. Of course, on account of the necessary travel which one is apt to do, the box should be compact and light. The many hand cameras as supplied at present are all that can be wished for. Yet by all means carry a tripod. A picture should always be studied on the ground glass, and unless the camera can be given a firm resting place this cannot be done. A rapid rectilinear lens of some reputable make should be chosen ; a poor lens generally results in poor work. And as for plates, a rapid orthochromatic one is to be highly recommended. Rapid, because the artist may sometimes be called to take a view which does not permit of time exposure, and orthochromatic for these will prove a great help to obtain clouds, and giving proper gradation and tone to the landscape.

A 5 x 7 or the popular whole plate are very convenient sizes ; if larger pictures are desired, these can easily be enlarged, but there are no limitations to the size of pictures, and after the print is finished, it is a good plan to take four pieces of blank paper, putting them on top, bottom and sides of picture, and move them until all objectionable parts are covered, and then trim fearlessly.

METALLIC spots on an unvarnished negative can be removed by rubbing with a piece of flannel dipped in turpentine.

A LITTLE ELECTION DAY EXPERIENCE. By R. D. O. SMITH.

WHEN last election day was approaching, some of our boys began to cast about for something attractive for the evening of election day, because, as everybody knows, all the boys will be up and anxiously waiting for the returns. One proposed to get a lantern and have the returns thrown on a screen across the street, and another suggested to fill in the time with pictures. Not that there was much novelty in either suggestion, but it was nevertheless entirely new in our town. Of course, suggestion in such a case only preceded action The boys knew where the lanterns were to be got, and a little skirmishing only was needed to find the place. The club room is located on a prominent corner, and has a corner window. Just out in the street, across a pretty broad sidewalk, is a convenient electric light pole. Another planted temporarily on the other street would afford means of hanging a big white curtain out in the street in front of the corner window. Then the question of pictures arose and means for putting the returns on slides. Of course, any number of regular slides were available, but it was suggested we ought to have some at least pertinent to the occasion and calculated to keep the crowd good natured. There happened to be temporarily sojourning in our midst, a young lady with a pronounced talent for drawing, and her fad was comical and monstrous faces. She offered to make some drawings if a glass could be prepared to take the ink. We naturally hesitated to incur the expense of photographing a great number of things which would lose interest after election night. So we attacked the problem, with a success which warrants me in offering this account of it. Others may have done the same thing, or may have done it better than we did it, but, anyhow, it answered our purpose well.

First, after various experiments we found that a thin coating of gelatine on the surface of glass would take india ink pretty well—well enough for our purpose—and, accordingly, a pile of old negatives was depleted for material. A box was filled with a solution of bicarbonate of soda and the old negatives were duly put to soak therein, being supported and kept apart by a rack of nails driven into the side of the box. In a few hours the films were ready to compromise by coming off. The old negative glasses were then washed, dried, and duly cut up into pieces $3\frac{1}{4}$x$4\frac{1}{4}$ inches.

A little ordinary sparkling gelatine was then dissolved in water. It was so strong with water that it remained fluid when cold. A little of this was flowed over the plate, which was then set up in the rack to drain and dry.

When thoroughly dry, our young lady friend proceeded to exercise her talent, but it was soon apparent that her invention would speedily collapse under the strain. She then essayed to copy some of the newpaper cartoons, but the labor of reducing them to the proper size was considerable, notwithstanding her deftness, and besides, it soon became apparent that she would tire of the job long before the desired number had been completed. It often happens that the inventor finds himself confronted with the necessity to make other inventions to avoid losing those he has made. That's why necessity is the mother of invention, just as it was in this case. We had drawn upon the resources of the club and the local newspaper office, and had gathered in a great lot of material in the shape of *Puck*, *Judge*, and newspaper cartoons, and we couldn't bear to see all this good effort wasted.

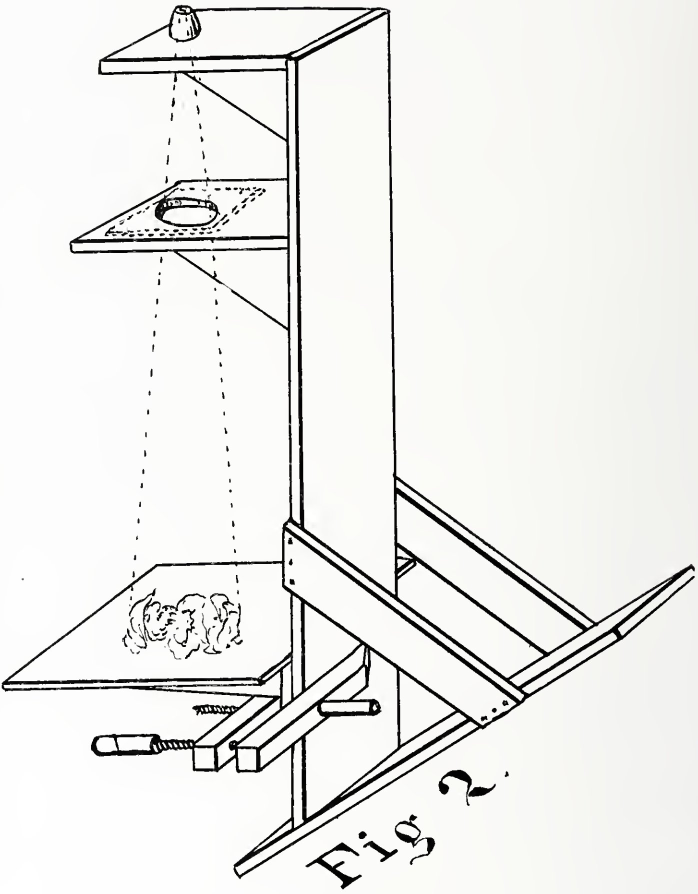


Fig 2.

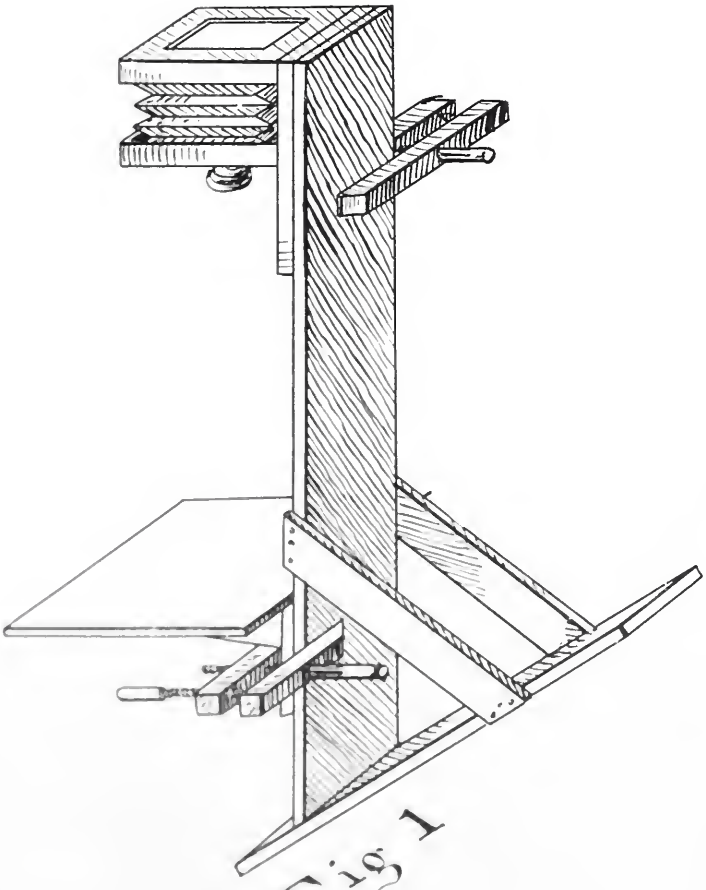


Fig 1

First, a couple of boards were gotten into the enterprise in the shape of a stand like

A little camera was mounted on the upper end and a sliding table to hold the picture was mounted near the other, and held in place by a common cabinet-makers' hand screw. The ground glass of the camera was removed and a wooden plate was substituted, with a circular 3-inch opening. On this the gelatined glass was laid, and we found a light dusting over with French chalk just imparted translucency enough to make the image nicely visible, and lo! the picture was reproduced with proper reduction, and any deft fingers could trace the lines on the gelatine surface. When dry the French chalk would all rub off and leave the slide transparent.

But even then time threatened to beat us, and necessity bore more invention.

This time a peep hole and another table were tried, minus the camera, and it was found quite easy to trace the lines without the camera and the dark hood over the head which the camera made necessary.

But the nose and other things persisted in being more or less in the way, and necessity was once more invoked to exercise her maternal office.

This time things were somewhat reversed. Here you have a fair peep hole for the eye in the top of a hollow cone long enough to let the nose hang down out of the way, a rest for the forehead to keep the eye steadily and easily at the peep hole, and a table for the slide without anything to obstruct the hands.

With this simple apparatus any one with reasonably steady nerves and a little skill with the pen, can reproduce cartoons and pictures of any kind, for purposes such as we had in view, with great rapidity, and aside from the element of time with practically no cost. Of course, artistic skill enhances the result, but for such temporary purposes artistic skill is seldom a necessity, and very generally is unimportant. Any way, our show was a great success. We had, impartially, the laugh on everybody, and when our friends in a neighboring town got wind of it, they sent a messenger every half hour to borrow the pictures as fast as we used them, promising to stand half the expense of their production for the privilege of using them—a promise, by the way, which they kept in the way political promises are usually kept.

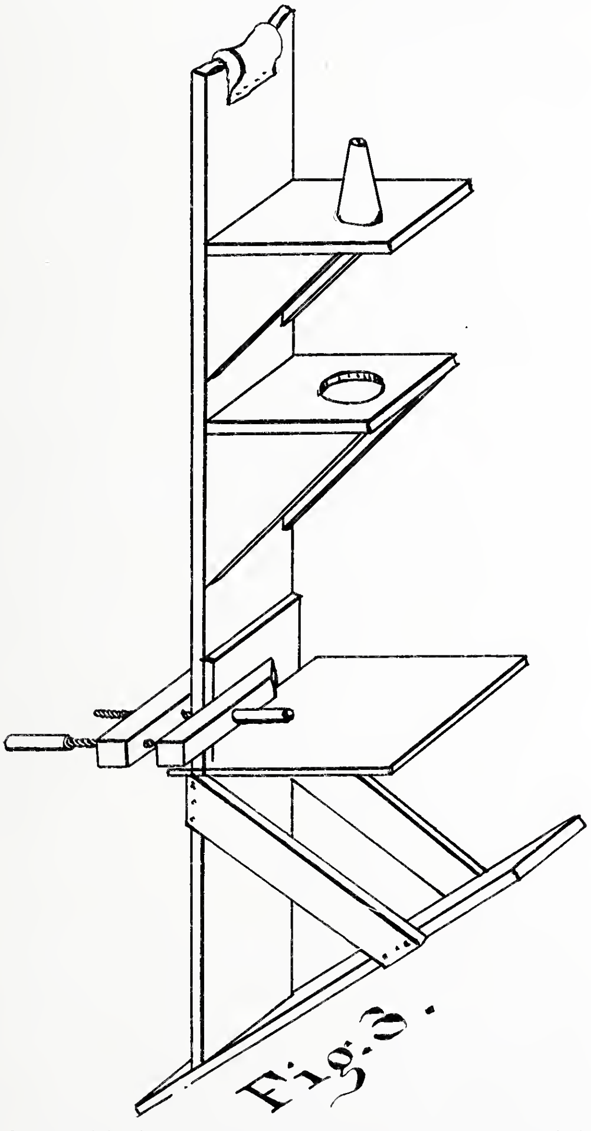


Fig. 3.

When other fingers were enlisted in the work of reproduction our young artist varied and relieved the monotony of the task she had consented to by coloring a lot of them—the means being some aniline inks—red, blue, green, purple—and some oil colors which were found properly transparent, like prussian blue, the lakes, and gamboge. Time did not serve for much experimenting in this line, but we did enough to find abundant reason for anticipating success whenever experiments are made. No doubt our friends, the plate-makers, could tell us just what to do, right off hand. Perhaps to take the colors nicely the gelatine needs to be baked, or bathed in alum, or some other way treated.

I suppose, if coloring is intended, it would be better to make the drawing in some pale color, which would not obscure the after tint as india ink would do. But all that I leave now to younger heads and hands. I am satisfied we did it pretty well last election night.

NATURALISTIC PHOTOGRAPHY. BY P. H. EMERSON, B.A., M.B. (CANTAB).

CHAPTER II.

(Continued from Page 416.)

Their relative rapidities are as 100:400 or as 1:4. That is the lens working at *f*/10 is four times as quick as the lens working at *f*/20.

This holds with all lenses of whatsoever kind. But it must be remembered that working aperture is not necessarily the diameter of the lens-tube, but of the area through which the rays pass, thus fixed stops or introduced diaphragms necessarily diminish the working aperture, but when comparing two lenses in this way full aperture is understood, that is there are no diaphragms introduced. The student will now understand on what the quickness of the lens depends and why the introduction of smaller diaphragms increases the length of exposure, *f*/8 is a quick lens, *f*/6 very quick, and *f*/3 the quickest ordinarily made.

Now the next point is *what size will the image be on our ground-glass.*

Now it is evident that the size of the image depends upon the focal length of the lens and the distance of the object from the lens. We must remember here that there is one focal plane in a camera where the image is seen sharpest, by wheeling out or wheeling in the camera this sharpness is blurred. Now if a man is focused sharply and he moves *away*, we must follow him by wheeling in to get him sharp, and he gets smaller; and conversely, if he approaches we wheel out to get him on the focal plane and he gets bigger. Now providing we know any two of the factors, *i.e.*, focal length of lens, distance of object from lens, and size of image, the third can easily be found.

Let F be the principal focal length of the lens, D the distance of the object, F_1 the focal length at which the object is sharp. Then

$$\frac{1}{F} = \frac{1}{F_1} + \frac{1}{D},$$

e.g. Take a lens of 20 inches equivalent focus and suppose the foreground or nearest object we require to be sharp to be between 60 and 70 feet, say 800 inches; we have

$$\frac{1}{20} = \frac{1}{F_1} + \frac{1}{800},$$

$$39\ F_1 = 800 \text{ or } F_1 = 20{\cdot}51.$$

So that the camera must be wheeled out half an inch beyond the position for parallel rays in order that the object be sharp; and the size of the image will be $\frac{1}{40}$th of that of the object, actually as 20.51 to 800.

Referring to our figure illustrating conjugate foci, we may state, for all practical needs, the object being distant 40 times the focus, the image will be $\frac{1}{40}$ of the focus beyond the focus for parallel rays, $\frac{20}{40}$ or half an inch.

If we wish, therefore, to get an image of a certain size, with a certain lens, we can determine how far off to place that object to get our desired size. Mr. Sécrétan, however, has worked out a series of most useful tables which are published.

Now for the time I wish my readers to regard all photographic lenses ever made as being exactly like one another, except in the matter of focal lengths and angles of view included, and when we regard the *size of images* and amount of view taken in, all lenses may be considered on these points as only quantitatively different. Now it is perfectly obvious that the narrower the angle of view included in the picture the longer the focal length. Therefore, the question arises within what angle must we work. Perspective has clearly shown that we get better and more pleasing views of objects if we draw them from a point distant twice the distance of the greatest diameter. Now if we get off to that distance we shall find it advisable to use what are called long-focus lenses, and these necessarily include a small angle of view.

Perspective and experience show that the best working rule for choosing the focal length of the lens is to select one twice the base length of a picture as nearly as can be though a focal length of the diagonal of the picture is safe. It will thus be evident that if you use a wide-angle lens a *part* of the picture will be in true perspective; and if you take a picture with a lens of 20 inches focal length, and one with a lens of 12 inch focal length, there will be a part of the picture in this which can be enlarged so as to give exactly the same picture as the 20 inch focal length picture. Now the great advantage to the novice to be derived from the use of lenses of long focus is that he cannot so ignorantly employ them as he can the wide-angle lenses. Then it will be asked, "what is the use of these wide-angle lenses?" These lenses were made for people (not artists) who wished to embrace the whole of nature in their photographs, and they were *made to include* large angles of view, not to be correctly employed for using portions of the picture only. When a view is taken with a wide-angle lens close up, as is usual, the resulting photograph is artistically false, and these lenses give false drawing thus, for we must look at the complete result, and not cut out that portion of the picture which is in good perspective. The near objects are relatively out of proportion; the eye cannot take in a wide angle of view such as these without straining itself terribly, which is not *looking* at a thing. We shall be told that if we place the eye at the distance of the focal length that the perspective will be true. It will be true for the small portion we can see, but not for the parts that we have to strain our sight to include.*

Let anyone take a large building with a short focus lens and then place his eye at the distance of the focus, he will see, not the building, but a few *sharp* windows, with modeling and tone such as he never saw in nature. Putting the eye at the distance of the focal length is the best point of sight when the picture has been taken in true perspective. This may be said to hold of all pictures.

---

* We may state that the drawing given by the lens is the same as with a pin-hole similarly disposed to the plate, the drawing being in *theoretical mathematical perspective*, and may convince some who would "strain at a gnat," that they see the whole picture as they would view the object.

It will be seen from what I have said, that the wide angle lenses can give true perspective for certain portions of their picture if correctly used, but that is no gain, and their use in ignorant hands is so dangerous and their other bad qualities so truthful, that I have no hesitation in condemning them for artistic work. The focal length of the lens then should be as a working rule, twice the length of the base of the picture, that will meet the case. A lens should never include more than 40 deg.

Apart from what may be called false perspective lenses (which they are if *used* for the purpose for which they are made), for it cannot too often be repeated that they are never made for the purpose of using them so they would be pictorially long focus lenses, *i. e.*, when portions of the picture are correct in perspective; there are certain *single* lenses that distort objects. Now the shorter the focus of a lens (the diameter remaining the same), the greater is the distortion. By using a diaphragm this distortion varies, for if the diaphragm be brought right up close to the optical center of the lens, its center only is free, there is no distortion, but if it be moved away from the lens, distortion follows within certain limits, for if moved towards the lens we get barrel-shaped distortion or a bulging of the sides of a square. By moving the diaphragm behind the lens towards the ground-glass we should get pin-cushion distortion or the opposite kind of bulging. This distortion is overcome say in a rapid rectilinear lens by uniting two objectives and placing the diaphragm in the middle; in short the lenses neutralize each other.

Now all single lenses have this distortion more or less; it is not perfectly corrected, it cannot be, so that is another point against them. Of course, if a large aperture single lens be employed and the picture only taken with the central or more parallel rays, this distortion is almost inappreciable, but as we have said it is there, and the more of the lens is used the more distortion must you get. We have hitherto supposed all lenses to be theoretically alike for simplicity's sake, and every lens to possess the same qualities.

From this short study we have arrived at the fact that for naturalistic photography narrow angles, long focal lengths and rectilinear lenses must be used.

But there are many other qualities possessed by different lenses that we must discuss and weigh in the balance, and altogether try and find out what are the best all round lenses, so that we may give as true a visual impression of nature as possible.

This leads us to consider peculiarities in lenses called aberrations. If we return to the pin-hole camera we remember that as we increase the size of the aperture beyond a certain size the image becomes blurred. Now as our single lens gets bigger the marginal and central rays do not come to a focus on the focal plane at one and the same time. This is called spherical aberration because it results from the *sphericity* of the lens.

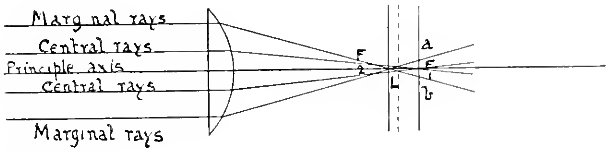
The other aberrations which we shall discuss as we proceed are chromatic aberration, curvature of the field, distortion, astigmatism, and lens reflection.

Now a lens with spherical aberration gives a halo to the image, the halo constitutes lateral spherical aberration.

To illustrate:

Figure VII illustrates the passage of marginal and central rays through an uncorrected lens, the marginal rays come to a focus at $f/2$, considerably nearer the lens than the focus of the central rays which takes place at $f/1$, the distance between $f/1$ and $f/2$ is what is termed the longitudinal aberration, the transverse aberration is shown at A B. This occurs as an outstanding halo round the best focus possible, viz., at $f/1$. Between $f/1$ and $f/2$ there is a portion L, known as the least circle of aberration, and is the smallest section it is possible to make—the cone of rays convergent from the lens. The measure of a spherical aberration is greater or less according to the curves assigned to a glass lens constructed to produce a given focus. Practically an infinite number of curves may be ascribed to give the same focus, all differ-in the amount of longitudinal and transverse spherical aberration. Using glass of refractive index 1.5 the "crossed" lens in which the curvatures of the radii are as 1 to 6 will have the least aberration and a deep meniscus the most. Referring to the lens as shown in Fig. VII the aberration given by this is nearly four times greater than if the parallel rays were re-

Fig VII



ceived upon the convex surface, or in the words if the lens had been reversed.

The student would do well to examine this aberration practically by focusing a lamp flame with the full aperture of an uncorrected lens, it is most visible with lens of short foci, relatively to their diameter. If we utilize only the central rays, and this is readily done by using a diaphragm, we shall be able to nearly destroy the outstanding aberration when the aperture is reduced to about *f*/15.

Spherical aberration is destroyed completely by combining a negative lens with the convergent lens. Such a lens is termed aplanatic. In lens making, however, it is necessary not only to cure the spherical aberration but the chromatic aberration also, the latter must always be considered of primary importance in a well corrected lens. The form given to a lens will be determined by the purpose for which it is intended, such as, proper correction, of flatness of field, equality of illumination, freedom from marginal astigmatism, etc., so that it frequently happens that spherical aberration cannot be completely cured, sometimes the effects of correction are to leave outstanding possible spherical aberration, when a lens is said to be under-corrected. Ocasionally negative spherical aberration is found outstanding when the lens is said to be over-corrected ; in this latter case the marginal rays have a longer focus than the central rays. We should mention here that this positive spherical aberration is occasionally purposely left outstanding in lenses to give a *softness* to the picture. Single lenses are invariable supplied with a fixed stop ranging between *f*/10 to *f*/16, and at their apertures the aberration is eliminated, if larger apertures are worked with, then the spherical aberration will assert itself. There is another defect noticeable in single lenses, whether corrected or not for spherical aberration.

If we examine a point of light off the axis of the lens it will be found that the central point or areol (if spherical aberration exists) lengthens as the point departs from the principal axis, forming what is technically termed a *coma*, this of course is inadmissible and has to be cured by the aid of the diaphragm, in an uncorrected single lens it requires a stop of about *f*/30, but if a "compound single" combination from *f*/10 to *f*/16.

Delicate optical instruments, like lenses, must, it is needless to say, be carefully protected. A good lens should be free from scratches, striations, dull patches due to imperfect polishing, and veins; but air bubbles do not affect its value, for it must be remembered that the shape of the hole through which the light passes does not affect the image, save only by cutting off some of the light. Thus, if a wafer be stuck to the center of the lens, the image will be found unimpaired. Dust and dirt, however, though they do not seriously impair the definition of the image, yet cut off much light, as will occur to any one when he thinks of the difference between the light of a room, when the windows are dirty, and when they are perfectly clean. Lenses should not be left in bright sunlight, for this causes a change that slows them, the dark also injures them in certain cases, for, as all microscopists know well, darkness causes a change in Canada balsam, with which lenses are cemented together.

Mr. Dallmeyer insists that lenses should be kept dry and free from sudden changes of temperature, otherwise they may tarnish or sweat, as it is called. Any one who has been troubled with this sweating will never forget it. Our experience is that the best way to keep lenses is in small leather, velvet-lined cases. We generally keep with them a piece of soft chamois leather, or an old silk handkerchief. No compound of any kind should be used to clean lenses ; if anything appears to be going wrong with them, they should at once be sent to the maker.

A valuable little tool is a view-meter. The handiest and compactest we have seen is that supplied in telescopic form.

(*To be Continued.*)

AMSTERDAM BY A. PIEREN

THE FORD BY CARROLL T. TYSON, JR.

INTENSIFICATION AND REDUCTION —A CHAPTER FOR BEGINNERS.

BY THE REV. A. H. BLAKE, M.A.

Most prosaic certainly, but very necessary, this afterwork upon the unsatisfactory negative, and how often we require it, I fear, the beginner would blush to own. That face, that child's pinafore, that light on the water, are *so* dense they will not print out at all in reasonable time, and give nothing but white paper with very faint markings, in spite of all our blandishments. Then again, that negative, owing to there being a fluctuating light in the dark-room, has been carried much too far in development, and is almost impenetrable, taking almost as long to print as the fabled negative of the London printer, which he *said* he left out every day for a month during the prevalence of a London peculiar.

This negative, on the other hand, after fixing, was so ghostly a character, that when held up to the light of an ordinary lamp there was some difficulty in determining what it really was intended for, and something must be done if it is to be brought up to anything like printing density.

The two methods by which these faults in negatives may to some extent be remedied are known as intensification and reduction.

First let us give the formula for what is known as mercurial intensification, and explain the *modus operandi.*

We shall require ½ ounce of powdered bichloride of mercury (which should be treated with due respect, as it is very poisonous in its nature), ¼ ounce of hydrochloric acid, and a 40 ounce bottle.

Now take the mercury and put it into a vessel containing the hydrochloric acid, and then when dissolved pour the mixture into the 40 ounce bottle filled almost to the top with water.

This solution will keep an indefinite time, and can be used over and over again till its strength is exhausted, as there is no chemical change, but simply exhaustion of its active power.

We shall also require a 10 ounce bottle, in which we put 1 ounce of ammonia ·880, and fill up with water, making what is for practical purposes a 10 per cent. solution

We now take our plate to be intensified and give it a thorough washing to get out of it the last trace of hypo, for the intensification by mercury will show up all the traces of hypo left in the film by staining those portions a rich brown.

After washing, the plate is put into as much of the mercury solution, poured from our stock

ENCOURAGEMENT BY GEO. D. FIRMIN

bottle, as is required to well cover it, and is left there till it is bleached well and shows *pure white* right through the plate.

Again place the negative under the tap and give it a good washing of some quarter-hour duration.

We now pour into our dish some of the 10 per cent. ammonia solution and gently and rapidly slide our plate into it, taking care that there are no markings formed, and, if necessary, gently rubbing its surface with a dab of soft cotton wool.

All that now remains will be to wash again, and the plate will be ready for drying.

PORTRAIT BY R. W. HARRISON

Should the first operation be insufficient to procure the necessary density, it can be repeated till the required amount is obtained.

But turn we now to the opposite process. Our negative, instead of being too thin, is too dense, and we require to reduce that density in order to make a good printing negative of it.

Where before the presence of hypo was a positive danger, here it becomes a necessity, so that if we discover our error we can proceed to reduce our negative as soon as it comes out of the hypo bath, and in truth this is really the best time of all to do it.

Taking the dish necessary to suit the size of plate we use, we put into it sufficient clean hypo solution of the ordinary strength used for fixing, and add a few drops of a 10 per cent. solution of red prussiate of potash, the following being the formula:—Into a 10 ounce bottle with glass stopper place 1 ounce of potassium ferricyanide, and fill up with water; shake till dissolved.

The strength of the reducing solution can, of course, be strengthened if its action be not rapid enough, by adding more of the red prussiate solution, but care must be taken not to get it too strong, or you will soon be left with a plain glass plate and a varnish negative.

But in thus speaking of reduction, we have only dealt with cases where reduction was necessary *all over* the plate; but this is not either the most difficult or the more usual complaint of negatives in this connection.

One part is far to dense in *comparison* with another part; here is a state of things more difficult to deal with.

One method will be to dip the negative as before into the hypo and put a strong solution of hypo and ferricyanide into another little dish and use a camel-hair brush to apply it to the part effected, great care being taken that the reducing solution does not run over the part which does not require weakening, as it will inevitably do unless the negative be repeatedly plunged into the hypo during the process.

At the best of times this is a very risky process, and unless duplicates of the negative be possessed, or very great skill employed, too dangerous to attempt.

SIGNS OF SPRING BY R. E. M. BAIN

Is there then no other way?

Take a piece of washleather and a little spirit of wine, and dipping the finger covered with the washleather into the spirit of wine, rub the place which is too dense until sufficient reduction takes place. Care is required here, too, not to carry the rubbing process over and beyond the required spot.

Some people have recommended to add a little emery powder on the tip of the finger, and use that as well to rub away the film a little. This also may with care be safely adopted, but careless handling will soon cause the film to be perforated.

With regard to the reducing solution above described, it may be well to remember that when the hypo and the ferricyanide are once mixed they soon deteriorate, and must be used at once, and after use thrown away, as they will not serve a second time. Mistakes and disappointments often occur from the expectation that the old mixed solution will do the work which it cannot do when once decomposition has set in.

The average amount of hypo and ferricyanide should be as sixteen to one, that is, to every 4 ounce of hypo add ¼ ounce of the ferricyanide solution.

It may some time be required to use the reducer not so much to thin down density as to remove fog.

This is a very difficult matter, and the cures for fog are far to seek, and many a beginner may well despair of getting rid of his enemy, fog, who seems to dog his footsteps, to lie in wait for him round the dark-room lamp, in the ammonia bottle, through cracks in his dark slides, anywhere, everywhere, in fact, and when once he has *got* there he is hard to oust.

This reducer which we have given may be used to get rid of fog, and Mr. Gamble it is, I believe, who says that the best way to use it for that purpose is to pour it upon the plate from a little distance, making it so to speak, splash on; this will render its action more on the surface of than in the film.

Our best wish for the beginner must necessarily be that he may have such successful negatives as rarely, if ever, to require a reducing or intensifying agent, but when he does he cannot do better than resort to the old-fashioned remedies here set forth, and when in difficulties resort to mercurial intensification to increase the density of his negatives, and the solution of hypo and ferricyanide to thin them down.

We do feel that a word of warning is due to beginners, lest they get into difficulties over these operations and then blame us, and, even at the risk of repetition, we must say again: in order that intensification by this method may be successfully carried out, *perfect washing* of negative is *essential*.

Again, *extreme* care is required to prevent the reducing solution from traveling beyond the required portion, and *frequent* dipping in the hypo is requisite as well as the keeping of the brush well within the outline.—*The Amateur Phographer* (English.)

SHIELDING ENLARGEMENTS.—A CHAPTER FOR BEGINNERS.

BY CECIL M. HEPWORTH.

A GREAT number of reasons have been advanced to prove that a small camera is better than a large one for the use of the average amateur. Many arguments have from time to time been cited to show that he will find it to his advantage to produce small negatives in the first place, and to subsequently make enlargements from those which are deemed worthy. It will hardly be doubted that the strongest of these arguments is that which points out the great facility which this method offers for that "faking" which is so dear to the heart of him who aspires to artistic results. Thanks to the excellent example which has been set before the world of photographers during the last few years, there are very few true amateurs who do not wish to turn out work that shall bear not only the stamp of their own individuality, but should also prove beyond doubt that that individuality is worth the stamping.

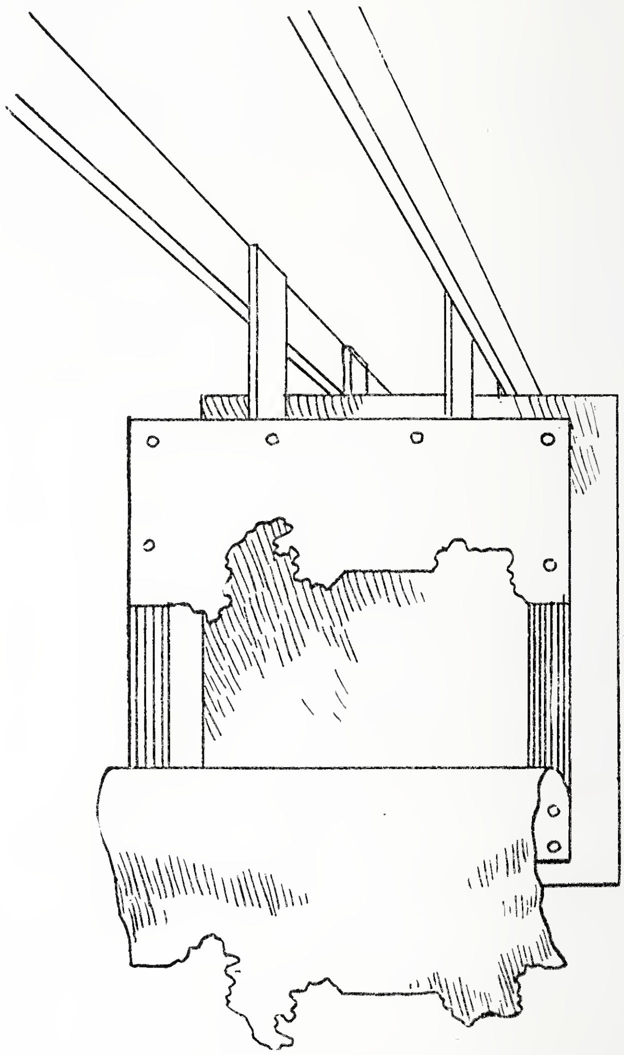
In the majority of photographs of this class, "faking" plays a very important part, and by far the most pregnant branch of legitimate fakement is that which has to do with the shielding of certain portions of a picture during the printing of the positive from the original negative. In the case of large negatives from which the print is made direct by contact, this toning down or subduing of certain parts is effected by pasting pieces of semi-transparent material on those portions of the original negative which it is desired should be less deeply printed. This is the most common method, but different workers have their different plans, as in all other branches of the subject, and each believes his own to be the best. Some cover the whole of the back of the negative with *papier minérale*, and then cut out with a penknife all those parts that do not require the shielding. Others employ a permanent backing of tissue paper on which they paint in yellow or black over the parts they wish to shield, while others again use the paint alone without the paper. In any case the object aimed at is the same ; the subduing of certain subordinate portions of the picture so as to bring the more important parts into greater prominence.

It need hardly be pointed out that this power of accentuating the more important constituents of a picture can only be successfully wielded by those who possess the artistic gift, or at least have a fair amount of that guiding knowledge which is the next best thing. With that, however, this article has nothing whatever to do. It is merely necessary to show how this shielding can be applied with even greater ease to enlargements than to contact prints, leaving those who run and read to apply the power for good or, perchance, for evil according to their individual lights.

One of the greatest advantages of faking during the enlarging process, in contra-distinction to that which is accomplished in the course of printing by contact is that there is no necessity to interfere with the original negative in any way. Many workers have a very decided and not at all unnatural objection to painting or penciling on a good negative, even when the modifying process is confined to the back, for faking of this kind—at all events, in the hands of the beginners—is an experimental business, and the results are never certain until they are accomplished. When the modifications of light and shade are to be made during the enlarging process no alterations whatever are made on the negative ; the shielding is done entirely by means of a screen or screens placed between the negative and the sheet of bromide paper upon which the picture is projected.

The simplest case of the kind is that in which it is desired to shield the sky portion of a picture the negative of which is too thin to yield the clear white space that is required where clouds have to be subsequently "printed-in." In a case of this description, where the horizon line is fairly straight, it is hardly necessary to have a properly supported shield, for a piece of card held in the hand is all that is requisite. But where the outline is of a more complicated nature it will be found advisable to support the shield in such a manner that it will remain stationary during the entire exposure.

A few weeks ago, under the title of "A Photographer's Overhead Railway," I described my own pet form of mechanical contrivance, whereby the various pieces of apparatus used in enlarging and other kindred operations are held in position and in their proper relation to one another. In this device the lantern, the easel, and all other things required in the enlarging process are pendent from a couple of overhead rails on which they are free to slide backwards and forwards as may be required, while the optical center of each always remains in the same straight line. Moreover any piece of apparatus can be placed on the rails, or removed from them without interfering with any other. If I describe a vignetting device for use with this contrivance, it will be easily seen how it may be applied to any other arrangement of a similar description.



It consists simply of a rectangular frame of wood, the opening in the center being nearly as large as the largest picture which is to be made with its help. The flanges of the frame should be about two inches broad, and it should be made of soft wood, so that paper may be easily attached to it by means of drawing pins. The frame is hung from the overhead rails in the same manner as all other pieces of apparatus, with the center line of the whole system running through the middle of the aperture. Its most generally useful position will be found to be when it is distant from the sheet of bromide paper, or other sensitive surface, by a about one-third of the total distance between that and the lens of the lantern. The simplest way to describe the manner of using the device will be by taking an imaginary case of a negative which requires faking.

We will suppose that the negative is the result of a snap-shot at a landscape subject, and that for some reason that we need not now enter into, the sky portion is unduly thin, and is decorated with unseemly and undesirable flaws. The horizon line is rather rugged in shape, and consists of dark trees in one part which you wish to stand out in marked contrast to the light sky, so that care must be exercised that the shielding of the latter does not overlap them.

The first thing to be done is to take an ordinary contact print from the negative and to casefully study it so as to decide exactly what treatment will cause it to yield the best picture. Having made this decision, with the result that you have a fairly accurate mental impression of the appearance and quality which you wish the finish picture to present, we may proceed to business.

Put the negative in the place provided for it in the enlarging lantern, and focus it carefully on the sheet of white paper that occupies the place on the easel which is afterwards to be filled by the bromide paper on which the enlargement is to be made. Let us suppose that you have decided that the picture will require a slight indication of clouds and that you have a suitable cloud negative all ready to be "printed in." Also that part of the foreground being unduly dense, will require a longer exposure than the rest of the view in order to bring out some necessary detail, while a hill in the distance is rather too prominent on the trial print and will be all the better for a little more atmosphere, which can be easily introduced.

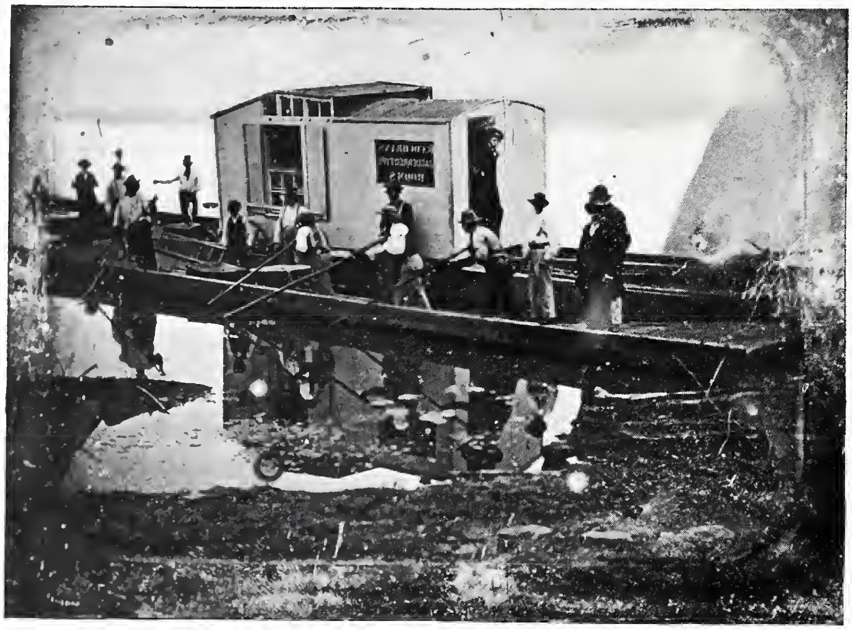
Having found that the image cast upon the screen is of the right size and well focused, draw the wooden frame into position a few inches in front of the easel, and stretch a sheet of brown paper over it with drawing pins. With a pair of scissors divide the paper all along the horizon line, and let the lower portion hang down out of the way, until it is required for future use. So much for the sky shield.

Now hang a second sheet of brown paper over the first by means of a couple of bonnet pins, and cut out with scissors, as before, all that portion which represents the piece of dense foreground that requires longer printing than the rest of the picture. Have a jagged piece of brown paper handy for shielding that mountain that wants more atmosphere, and then the lens may be covered, and the bromide paper pinned up in position on its easel.

First expose that bit of foreground for a length of time which is judged sufficient, when added to the further exposure it will get with the rest of the picture, to bring out the details to the required extent. Then deftly remove the two bonnet pins, and take the first shield out of the way. Now, when the whole of the landscape is receiving its exposure, is the time for the introduction of the bit of "atmosphere" in front of the distant mountain, and you do it by holding the jagged piece of brown paper over the portion to be affected for a sufficient length of time, keeping the shield moving all the time it is interposed, and at a considerable distance from the sensitive surface, so that they shall be no sharp outline to the shaded portion. When the exposure of the landscape part of the picture is complete, the lens should be covered with a piece of red glass to prevent actinic light from reaching the bromide paper, while enough of harmless light passes through to enable you to make the further necessary adjustments.

These consist of two operations: First, fold up into position again the flap of brown paper that was discarded for the time being when the sky shield was cut out. See that it meets the edge of the paper from which it was separated, pin it in position, and remove the upper shield, which is now no longer required. Secondly, replace the landscape negative in the lantern with the cloud picture that has been selected as suitable to the subject, and all is ready for the second exposure. This should, of course, be of short duration, but the question of its length need not be here entered into.

Enough has now been said to show the principle of "printing-in" as applied to enlargements; and the working out of suitable schemes for different classes of pictures with their different requirements, must, of course, be left to the judgment of the worker.—*The Amateur Photographer* (English).



A TRAVELLING DAGUERREOTYPER.

HELIOGRAPHY AS A PIONEER OF MODERN CIVILIZATION.

BY JULIUS F. SACHSE.

(*Translated from the German in Eder's Jahr Buch for 1897.*)

Few persons ever take into consideration what a great factor the Heliographer has been in the spread of civilization in all parts of the world.

Upon the western continent, the camera and sensitive plate for the past half century, has ever been one of the most active pioneers in the advancement of the great American Republic.

If we look back into the history of the outlying settlements, during the early 40's, and which then did not extend so far beyond the Ohio, we find that in most places, long before any local printing press was established, the itinerant daguerreotyper, with camera, buff wheel and fuming box, had made his advent, and established a regular circuit from town to town, extending his limits as new settlements were projected. He was but a prototype of the ferrotyper of the present day, who, with his portable studio, moves from camp to camp in the mining country, and is to be found in the wildest sections of the "Rockies." Nor does the itinerant photographer of to-day confine himself to this continent where he is largely represented in the wake of traveling circus or resorts for health or pleasure but even in cultured Europe he is occasionally met with. A case in point in the writer's experience, was during the summer of 1894, where a typical representative of the American ferrotype faker was met on the mountain top of at Oberhoff, in the fastness of the "Wilde Gera." Here he had squatted upon a lot just beyond the Kursaal enclosure—van, tent and all. The sign upon his traveling studio set forth that "Permanent portraits, could here be had according to the American system upon sheet iron (*eisen blech*)."

In early days the itinerant daguerreotyper, photographer, or tintyper, call him what you may, was ever an advance herald of the coming civilization, no obstacles were too great for him to surmount, no river too swift, no hill or mountain too steep or rugged for him to surmount, no prairie too trackless; wherever any pioneer settlement was formed, there was to be found the ubiquitous heliographer, often long before the town, camp, or digging boasted of church or preacher, or had evolved itself from the state of frontier lawlessness and mob-rule into a law abiding community.

In many of these frontier towns or mining camps, where the gambling-hell, the saloon, and pistol were the ruling factors, and the only justice dispensed, was of the kind administered by Judge Lynch, the first dawn or sign of order and modern civilization, was the advent of the humble heliographer with his unpretentious car, which served him as house, home, studio and laboratory all in one. This installation, a harmless one, with its few and crude accessories, was frequently set up in the very midst of a lawless camp. The operator, however, remained safe and unmolested, where a missionary or preacher could not have remained for a day.

There always appeared to be a feeling of kinship between the sturdy pioneer and the itinerating heliographer, which in the case of the lawless element changed to one of respect; and there are few cases upon record where one of these traveling "artists" was molested.

The illustration accompanying this paper, is a copy of an old daguerreotype, taken about 1847. It shows one of these traveling daguerreotype vans, which had been put on a rude flat boat upon one of the tributaries of the Ohio river. After it was loaded, a lad, an apprentice to the operator, daguerreotyped it from the shore seen in the foreground. This picture remained in possession of the operator until a few years ago when he, in his old age, gave it and its history to the writer.

The wandering and peripatetic heliographer is frequently made the butt of his more aristocratic brother of the studio, yet it remains a question whether the regular studio "artist" ever filled any mission in the interest of civilization, akin to his humble brother with traveling van and outfit. What refers to America, also is the case in Asia and Africa. Wherever colonial possessions are held and permanent settlements are attempted, the itinerant photographer follows in the wake of the adventurer and explorer, a true pioneer of modern civilization.

SMALL *V.* LARGE NEGATIVES.

BY JOHN H. GEAR, F. R. P. S.

By far the greater number of amateur photographers are the possessors of apparatus of a small or medium size, and amongst whom there is a perpetual discontent, a feeling they are seriously handicapped against their more fortunate contemporaries who follow the dictum of every ambitious fancy. Not only with those who are perhaps unable to conscientiously expend the requisite amount, but it does exist, I know, with those in a position to lay out £50 or more upon 12 by 10, or 15 by 12 size apparatus, but who are restrained by economical wisdom. Nevertheless they are none the more satisfied, they are not actually *hors de combat* with their lucky photographic *confrere*. I would endeavor to allay the feeling of such an one by reminding him of the attendant cost of working the large size plates beyond the initial outlay, the enhanced expenses incurred in getting about the country miles from railways, and sometimes almost impossibilities, the limitations there are in working large plates against small, and numerous other disadvantages. I am perfectly cognizant of the great pleasure in composing the picture upon a large focusing screen as compared with the quarter-plate screen, also in finishing the large negative direct with about as much ease in the manipulations involved as with the small size; withal, the advantages of the small camera for the average artistic landscape workers are not outweighed. For commercial photography it is a very different matter; professional men must be prepared to meet the requirements of their customers as expeditiously as possible, the time involved being one of his greatest considerations, he must therefore have apparatus suitable for his work, which will not allow either of the broader treatment it is sometimes necessary to give when making prints from enlarged negatives of great amplification. It is not to the photographer when engaged in his commercial pursuits I am addressing these remarks.

By way of offering a little consolation I would ask the uneasy one to reflect for a moment, and if he has time, to try and arrive at the approximate difference in the amount of his expenditure in plates, if he had been using, say 12 by 10 plates, costing 1s. 4d. *each*, instead of 1s. 6d. per dozen. In attempting this do not cast your eye over a few piles of the successful negative only, but be candid and admit the dust heap can lay claim to many more. Your retort—a very reasonable one too—will be "I should have been more careful with large plates." In that case, my quarter-plate friend, your experience would doubtless lack more than it does under the circumstances. Further, it must not be overlooked that small photographic gems would not necessarily be priceless jewels if they were of much greater area.

If then it should be our assumed misfortune to be the owner of a modest quarter-plate camera only, or should it be our lot to have obtained but a quarter-plate negative of an excellent subject, instead of making captious objections, why not make an enlarged negative, the *modus operandi* being about as simple as any other photographic operation to which careful attention is devoted?

Should the negative have a defect, or should it be desirable to get rid of an obtrusive detail, retouching can be applied with marked effect, as having a transparency next to deal with, anything overdone upon the negative can be corrected with ease. Great facilities for strengthening shadows are offered by the transparency, thereby reducing to a minimum work upon the finished print. If a landscape or other subject requiring the combination of clouds, they should be secured upon the transparency, in which case I strongly recommend the transparency to be made by contact in preference to making an enlarged one. Upon a small positive, the retouching needs being very carefully done, I admit, but it is infinitely easier to make a good combination by contact than enlarging in the camera; by the latter method the cost is greatly increased and the chances are the resulting negative may not be so successful, because in the quality of the transparency lies the secret to success. Two or three can be made by contact expeditiously and cheaply, the best of them taken, whereas one is apt to hesitate to make another if it has to be enlarged in the camera, if the quality of the one obtained is only passable.

THE OLD LYCH GATE BY ALEX. KEIGHLEY

PORTRAIT BY J. WELLS CHAMPNEY

For the transparency use a good slow dry plate which has the least grain. It must possess all the tones of the original negative, but the ratio of gradation in a much closer scale than in a transparency for viewing as a finished result. The deepest shadows should be of no great density, and the high lights showing very little, if any, clear glass.

The apparatus necessary to turn out the best results need but be of the simplest character; one essential, it must be absolutely free from vibration. The lens with which the negative was taken will answer every purpose if it will cover the plate and give good definition at a fairly large aperture. A double dark slide to take the largest plate to which it is intended to enlarge and an easel to carry the slide are all that is required, assuming that the camera is of such a form as will carry the transparency and rack from the front for focusing. The dark slide can be dispensed with if the dark room is conveniently appointed, the plate merely being fastened up with drawing pins; but, personally, I prefer to have large plates in a slide, and protected as much as possible. If the plate has to be taken from enlarging room and developed elsewhere the slide will be found the safest and most convenient. If a spoilt negative is covered with white paper and placed in one side of the plate-holder, focusing can be performed with a certainty, the plate-holder being simply turned over and shutter withdrawn to make the exposure. The side containing the sensitive plate should be boldly marked to reduce the chance of accidentally exposing instead of the focusing screen to one of gross carelessness. The room must obviously be perfectly free from all actinic light excepting that emitted through the negative and lens. Even illumination of the negative must be secured by a reflector at an angle of 45 deg. upon the outside.

A plate of ordinary rapidity should be selected; quarter-plates of the same batch emulsion for test exposures can always be obtained from the manufacturers.

If more or less diffusion of focus is required, my advice is, obtain it in printing instead of suppressing the definition in the negative; by this means the resulting grain is got rid of—in fact, the grain is often of assistance in preventing bronzing of the shadows, especially if the picture has received broad treatment.

When making an enlarged negative advantage should be taken of the possibility of correcting distortion should it exist in the small negative by reason of the swing-back not having been placed parallel with the vertical lines of the subject.—*Amateur Photographer* (*English*).

A MINIATURE—WHAT DOES IT EXPRESS? BY G. S. SOUTHWORTH.

In the wide range of art what does miniature-painting represent? There is one word *minutia*, multiform as it may seem; yet in getting down to detail, no form of portraiture has called for higher effort or more subtle artistic skill than this difficult, delicate and wonderful branch of portraiture. And as to authorities we may mention J. Staples-Rowe, and I. A. Josephi. Mr. Rowe as a high authority on this—one of the reviving arts of long ago—said recently miniature-painting wears out the optic nerve.

"Do you find that the camera does you any good?"

"No! I refuse to use the camera!"

Spoken to again, Mr. Rowe said, "I prepare my ivory in my own way"—and seemingly possessed of an elaborate secret retired into reticence.

Mr. Josephi was a little more candid. He said, during the passages of a studio conversation, that he did not owe anything to photography. This in brief and measured terms was what he said:—

"Ninety per cent. of those who paint miniature use photographs. Artists high in our profession do not. We consider the mere realism of the photograph degrading to the imagintion which is essential to an artistic conception.

It is needless to say that eminent artists, whose artistic skill and feeling have made them prominent in the world of Art, are a little off on the relation of high lights to low shadows.

Photography does not deprive the human mind of any gift or intellectual propensity; on the contrary it is of vast assistance. Nor should it be treated lightly by those who employ the length and breadth of what as a discovery, all considered, has been the greatest boon to the modern world; and the future of which no one can foresee.

Miniatures are what?

The art consists of *Reduction*. That is all there is to it; and there is no more powerful agent than photography to accomplish this result whether for the Living or the Dead.

Photography has, will, and always must continue to have a potent influence on art—whatever branch may be considered. The feeblings may wake up to another conclusion; but those with Argus-eyes see beyond.

PHOTO BY BYRON V. TOMPKINS

BRONZE OWNED BY ALEX. CALDWELL

THE ART OF MOVING PHOTOGRAPHY.

THE art of moving photography had its origin, or, to speak more strictly, its first suggestion, in that ingenious little toy known as the zoetrope, which enjoyed such great popularity some thirty or forty years ago. This, it will be remembered, consisted of card board-cylinder about a foot in diameter, which was rotated on a vertical axis and contained a series of vertical slots cut in its periphery. A strip of paper, on which were printed a series of moving figures, each one in a different position from its predecessor, was coiled around the inside of the cylinder just below the line of slots or peep holes, the distance between the figures being equal to the distance between the slots. As the cylinder was rotated, the figures appeared to be in motion. The illusion is explained by the fact that the eye is capable of receiving and recording only a given number of impressions in a given time, and if the successive pictures are presented to the eye too fast for their individual apprehension, they will blend, as it were, and produce on the mind the impression of a single picture.

The zoetrope had its day, and ultimately passed out of favor; but its very crude and imperfect moving pictures were full of suggestiveness. The optical laws by which the results were obtained in course of time attracted the attention of experimentalists in the then youthful art of photography. About ten years ago the French scientist Marey, while at work on a flying machine, obtained photographs of birds in motion by means of a number of cameras, whose shutters were operated by the wings of the birds as they flew across the room. The idea was then taken up and further developed by Dr. Muybridge, of Philadelphia. At an earlier day than this Mr.

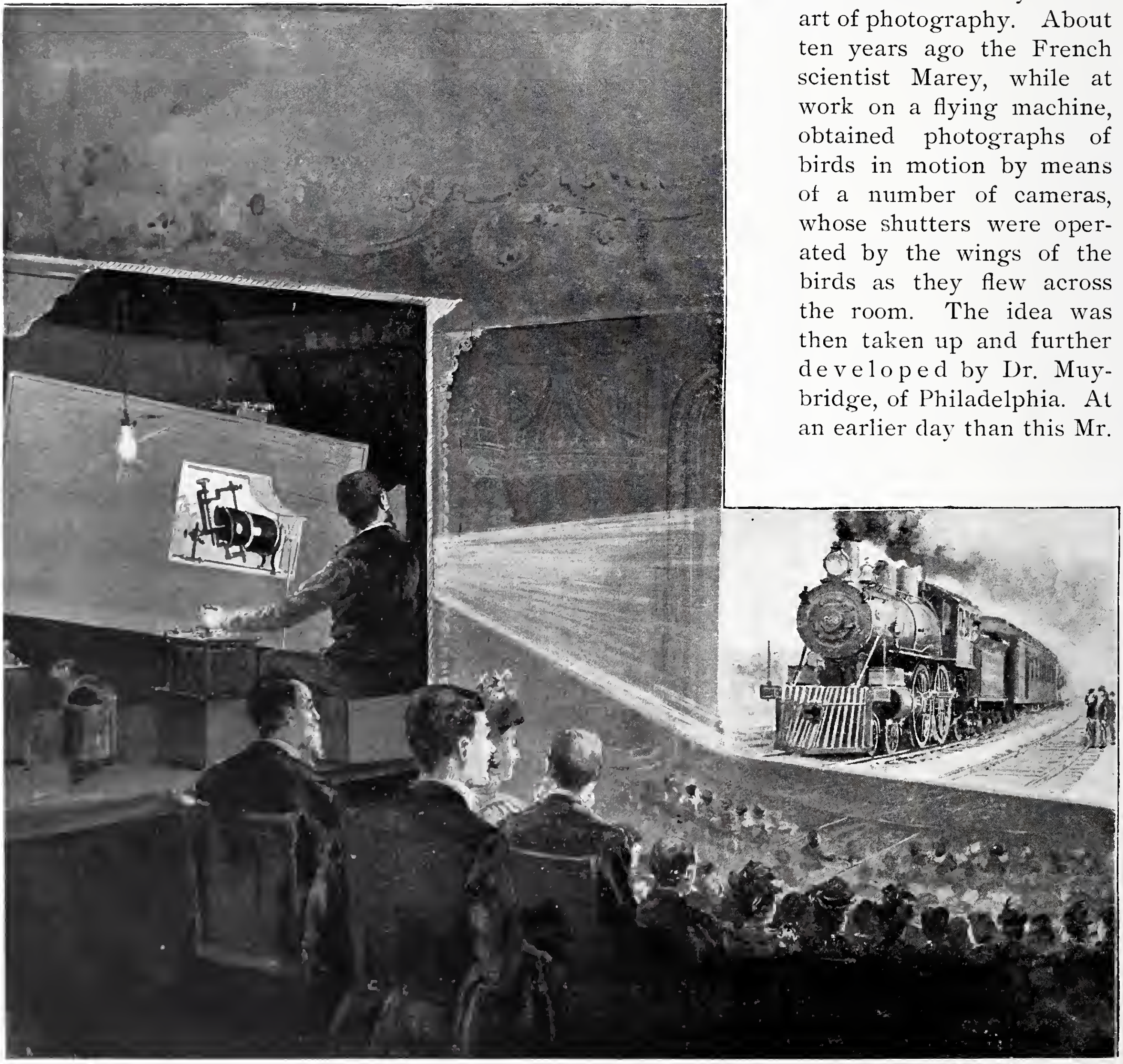


FIG. 1.—THE BIOGRAPH AT WORK IN A NEW YORK THEATRE

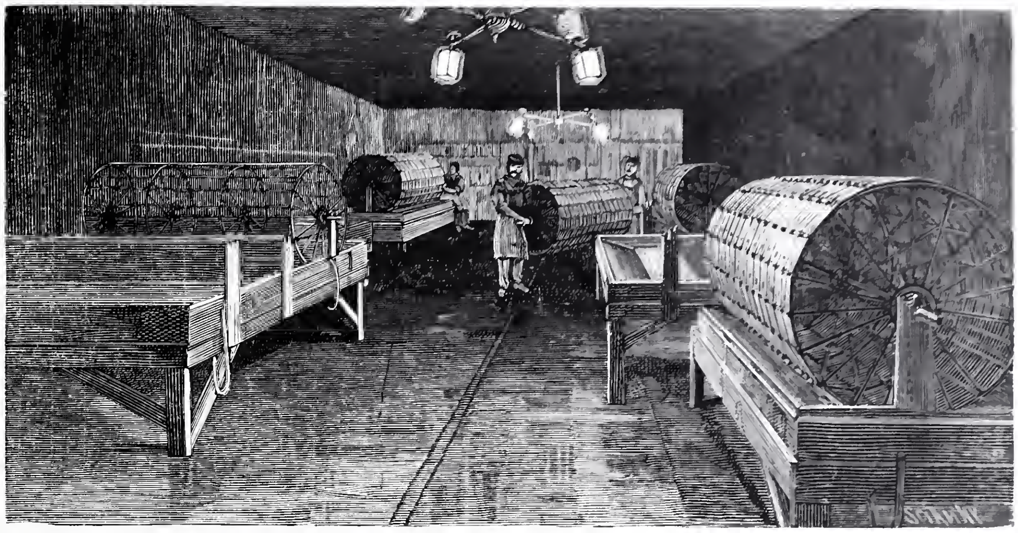


FIG. 2.—THE DARK ROOM AND REEL FOR DEVELOPING FILMS.

W. K. L. Dickson had been experimenting in the same field, and as the result of the subsequent joint labors of himself and Mr. Edison the famous Edison vitascope was produced. The Lumière Brothers, a firm of French photographers, brought out the cinematograph in 1894, and this was succeeded shortly afterwards by the biograph, which last device, and the "mutograph" and "mutoscope," are the inventions of Mr. Herman Casler and form the subject of the present article.

The machine, with which the original pictures are taken, is shown in figure 4. It is known as the "mutograph," nearly following the Latin and Greek words signifying "changing delineation." The camera frame is mounted by means of three adjustable legs upon a triangular turntable which may be placed upon any suitable support. Upon the top of the frame is bolted a two horse power electric motor, which is driven by a set of storage batteries, that will be noticed standing at the side of the machine. The combination of the turntable with the vertical adjustment before mentioned enables the camera to be shifted so as to take in the required field. In the front end of the camera is fixed a particularly perfect lens capable of gathering a great flood of light and producing an image of exceedingly clear detail. Above this lens on the front face of the camera is fixed a photographic "finder," which gives the same sized image as the main lens, and enables the operator to determine when the subject is properly focused. Inside the camera is a strip of gelatine film 2¾ inches wide and usually about 160 feet in length, which is wound upon a small pulley or drum. The length of the film varies for different subjects, and in the case of a prolonged scene, it may extend to several thousands of feet.

The film is led through a series of rollers and caused to pass directly behind the main lens of the camera, and finally is wound upon a second drum. The object of the rollers is to cause the film to pass behind the lens with an intermittent instead of a continuous motion. At ordinary speeds this would seem to be a matter of simple accomplishment; but when we remember that impressions are taken at the rate of forty a second, and that the film which is run-

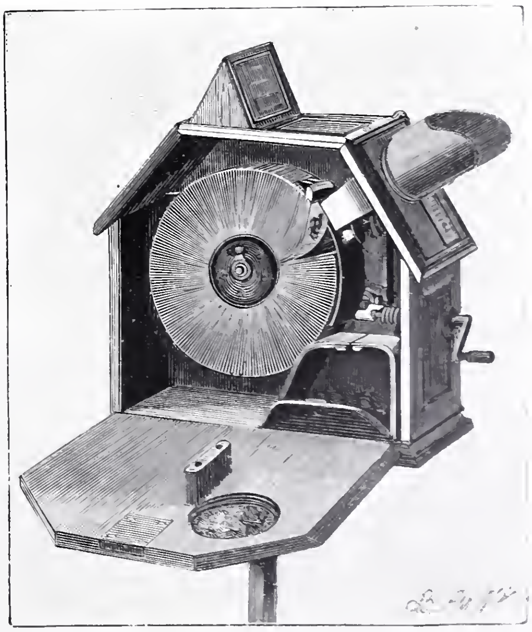


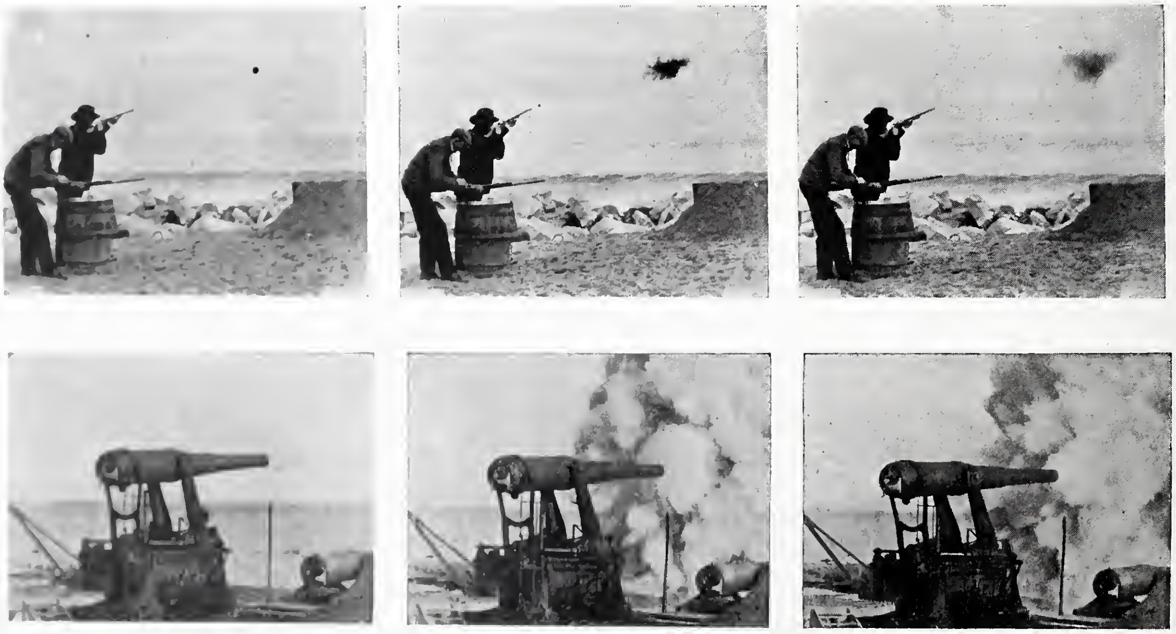
FIG. 3.—INTERIOR OF THE "MUTOSCOPE."

ONE OF A SERIES OF "MUTOGRAPH" PICTURES, TAKEN AT THE RATE OF FORTY PER SECOND.

ning at the rate of from 7 to 8 feet a second, has to be stopped and started with equal frequency, it can be understood that the problem was no easy one to solve. The film comes to a rest as the shutter opens, a phase or image is deposited, and the film starts again as the shutter closes. The impressions vary in actual exposure between one hundredth and one four-hundredth of a second. While the ordinary speed is forty a second, the mutoscope can take equally good pictures at the rate of one hundred per second if it is necessary. The higher speed would be used in photographing the flight of a projectile, or any object that was in extremely rapid motion.

The mechanism within the cabinet is driven by belting from the motor above mentioned, and the speed of the motor is controlled with great nicety by means of a resistance box which is shown in our engraving, Fig. 4, mounted upon the storage batteries. The apparatus is here represented in the act of photographing the celebrated "Pennsylvania Limited" while it was running at the rate of about sixty miles an hour. The mutograph is set up at the side of the tracks upon a solid platform ; the stretch of track is properly focused by the operator, and at the moment that the train comes into sight the current is turned on, the speed being regulated through the resistance box, as explained. By the time the last car of the train has flashed by, 160 feet of film has streamed past the lens, received its one thousand impressions and been wound with its precious record upon the receiving spool.

After the mutograph has done its work upon the films, they are carefully packed and sent to the New York establishment of the American Mutoscope Company. Here they are taken to the dark room, the interior of which is shown in the accompanying engraving. Ranged along each side of this room is a series of troughs above which are suspended large skeleton reels, 3 feet in diameter by 7 feet in length, the axis of the reels being journaled in brackets attached to the ends of the troughs. The films are wound upon the reels and subjected to the action of the various solutions for developing, fixing, etc., with which the troughs are filled, the reels being transferred from bath to bath until the films are ready to go to the drying room. In this same department are prepared the positive



"MUTOGRAPH" PICTURES OF CLAY PIGEON SHOOTING AND OF THE FIRING OF A TEN INCH DISAPPEARING GUN AT SANDY HOOK.

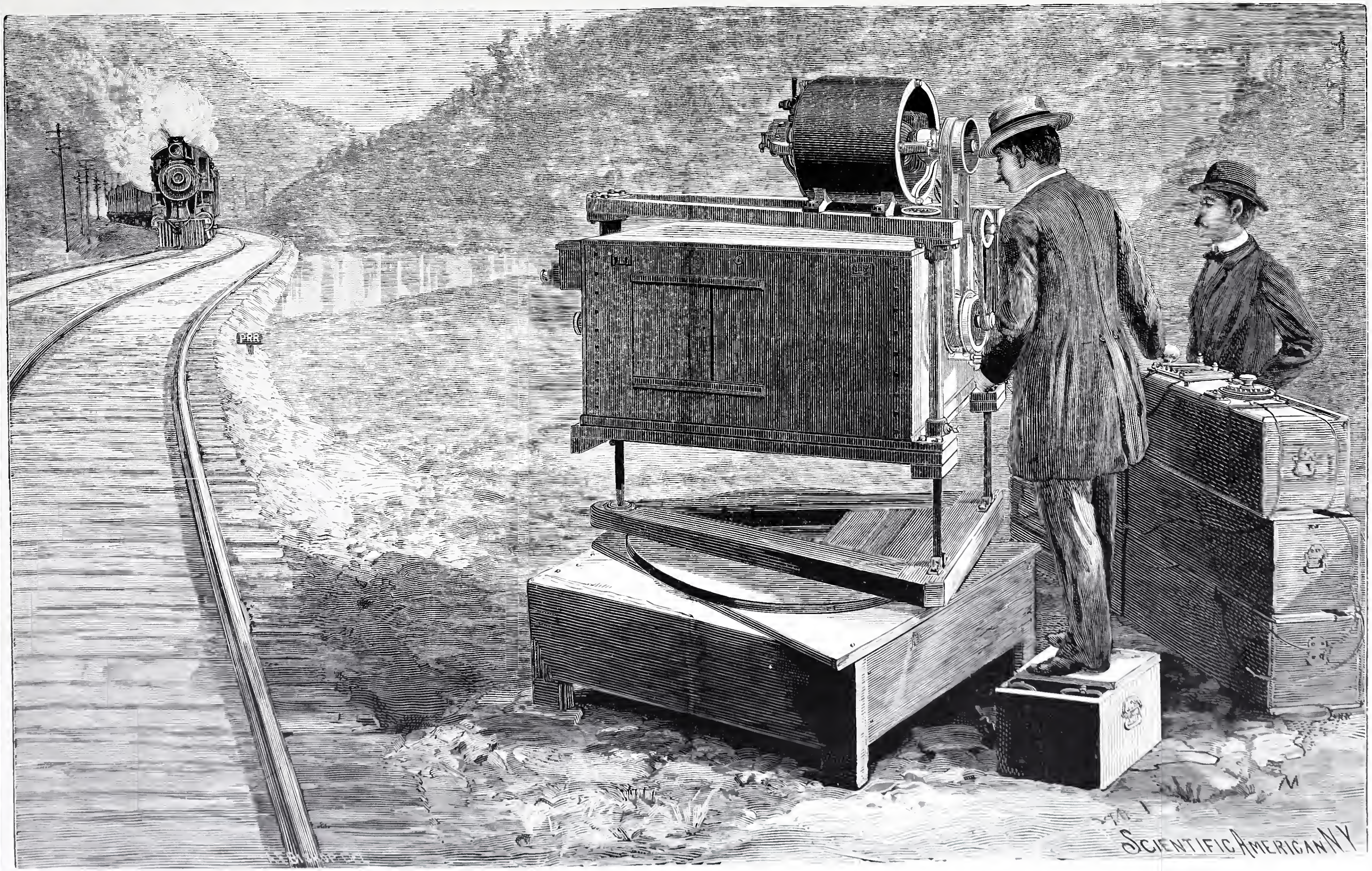


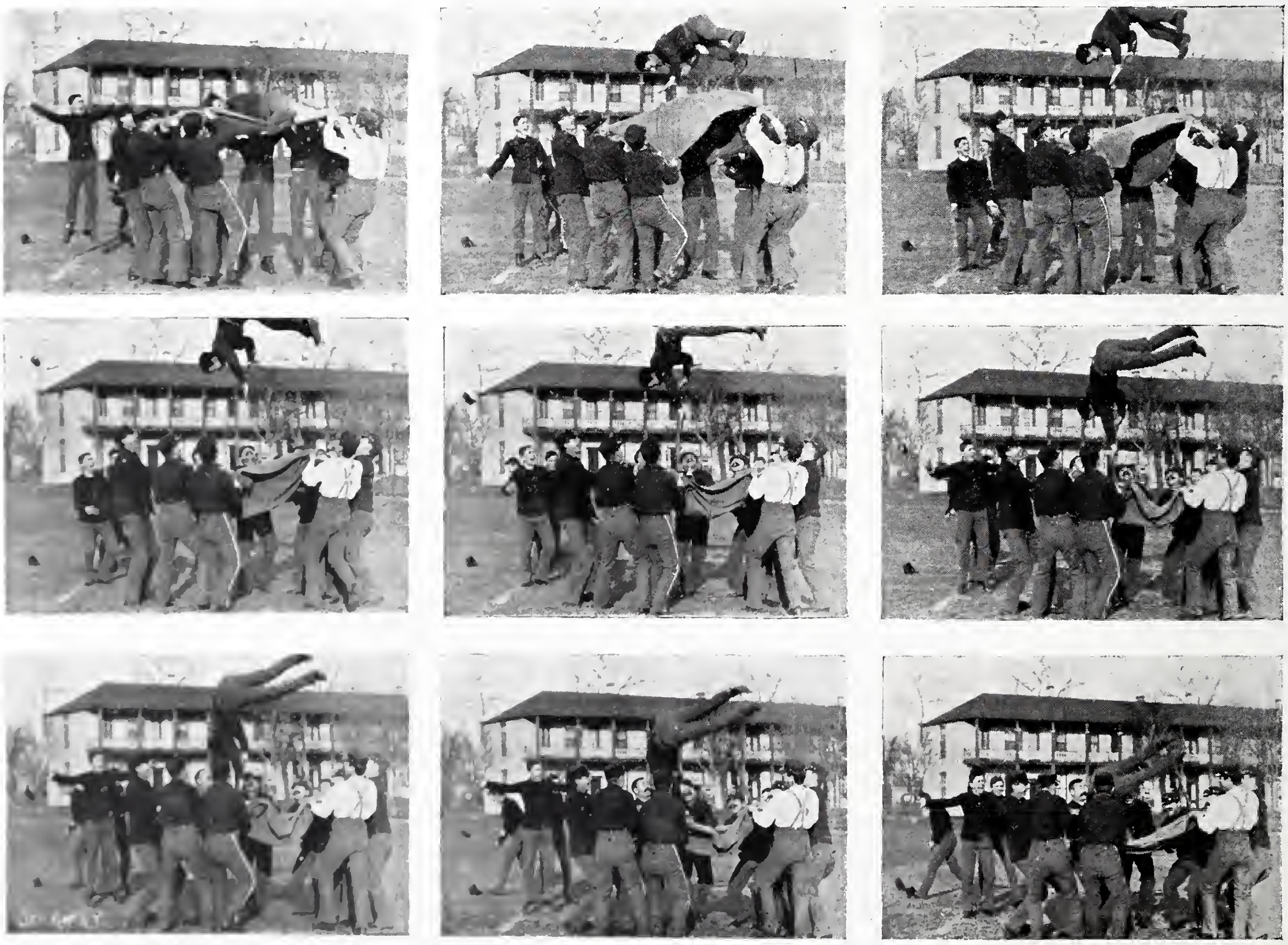
FIG. 4.—THE "MUTOGRAPH" PHOTOGRAPHING THE PENNSYLVANIA LIMITED WHEN RUNNING AT THE RATE OF SIXTY MILES AN HOUR.

PHOTOGRAPHY AS AN ADJUNCT TO THEATRICAL REPRESENTATION.

transparent strips for use in the biograph, and the bromide prints for the mutoscope, as will be explained later in the present article.

The reels are then carried to the drying room, Fig. 5, where the films are unwound on to large wooden drums, of about the same size as the reels, where they are carefully dried. At the far end of the room are seen the machines for cutting up the bromide prints, and here also is carried on the work of retouching the films and prints and preparing them for use in the biograph and mutoscope machines.

The biograph (or life delineator), Fig. 2, is similar in its general appearance and construction to the mutograph. There is a similar arrangement of rollers and mechanism for controlling the movement of the film, and the machine is driven, as before, by an electric motor and controlled by a resistance box, which in the engraving is shown to the left of the operator. The chief difference observable in the interior of the biograph, as compared with the mutograph, is that the former contains a hand regulating arc lamp of 5,000 candle power, which is placed behind the lens. When a subject is to be thrown upon the screen, a spool containing the positive film is placed in the cabinet and run with an intermittent motion through the controlling rollers, down between the lamp and the lens, and finally wound upon a receiving spool. In order to insure that the best effect shall be secured it is necessary to run the film at the same speed at which it was taken—a result which is obtained by the use of a tachometer. The engraving shows the biograph at work in a New York theatre. The whole apparatus and the operator are enclosed in a cabinet which is located at the back of the balcony. A hole is cut in the cabinet for the lens, and there is a window for the operator. The pictures are thrown upon a large screen upon the stage, and the subject which is represented in the engraving, an express train running at sixty miles an hour, is one of the most vivid representations of the kind ever attempted. The audience sees the clouds of steam, the whir-



"MUTOGRAPH" PICTURES OF A BLANKET COURT MARTIAL AT GOVERNOR'S ISLAND.

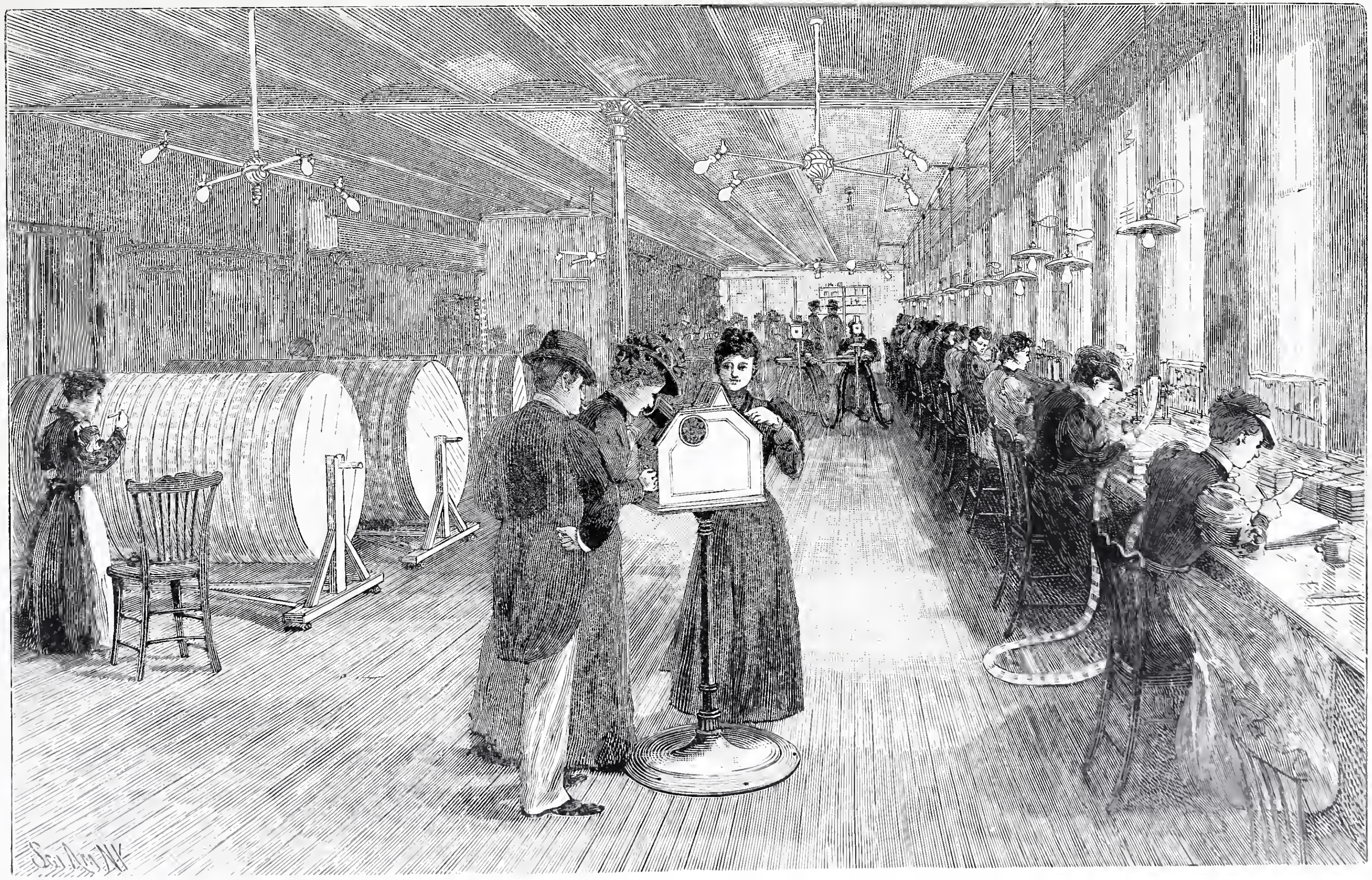


FIG. 5.—DRYING AND RETOUCHING ROOM; "MUTOSCOPE" SHOWN IN THE FOREGROUND.

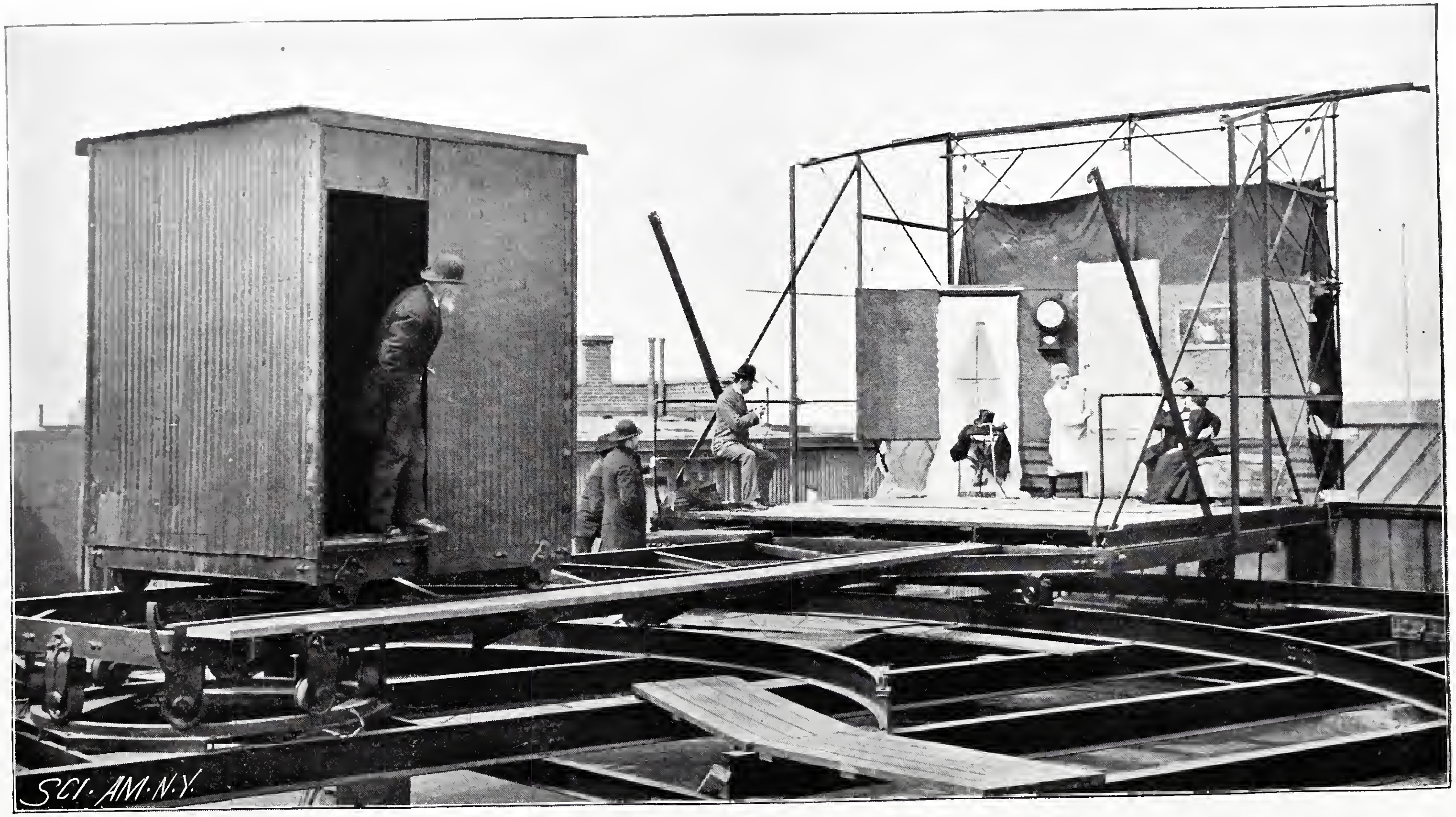


FIG. 6.—MOVABLE STAGE FOR PHOTOGRAPHING SCENES WITH THE "MUTOGRAPH."

ring driving wheels, the splashing of the water in the track tank as the engine takes in its supply, the passengers waving handkerchiefs and the workmen swinging their hats as the train goes by, and then the vacant track, all of which is represented with a clearness of detail that is truly remarkable. The excellence of the results is due very largely to the relatively great size of the original negatives, which measure $2\frac{1}{4}$ by $2\frac{3}{4}$ inches, and are, therefore, very much larger than anything that has ever been taken in this class of photography.

Perhaps the most novel of the three machines is the mutoscope, Fig. 3, which, on account of its compactness, simplicity of operation, and the large size of its pictures, is certain to win great popularity. In this machine the bulk, the complicated mechanism, and the motor of the biograph are replaced by a simple, box-like apparatus, no larger than the cover of a sewing machine. The enlarged pictures, 6 by 4 inches in height, are mounted in close consecutive order around a cylinder, and stand out like the leaves of a book, as shown in the illustration. In the operation of the mutoscope the spectator has the performance entirely under his own control by turning a crank which is placed conveniently to hand. He may make the operation as quick or as slow as fancy dictates, or he may maintain the normal speed at which the original performance took place, and if desired he can stop the machine at any particular picture and inspect it at leisure. Each picture is momentarily held in front of the lens by the action of a stop attached to the root of the box, which allows the pictures to slip by in much the same way as the thumb is used upon the leaves of a book.

The capacity of the mutoscope is coequal with the camera. It reproduces in motion anything which can be photographed, whether motion of human bodies or movements in mechanism or nature. Thus the Falls of Niagara, conflagrations, moving trains, animals in action, athletic games and sports, scenes from plays introducing prominent actors in favorite roles ; in fact, any scene can be reproduced with perfect fidelity to nature and with the actual movements represented by the scene depicted in a most realistic way. Important events in public or private life can be perpetuated, such as parades, military, civic, etc., preserving for years to come the movements and gestures precisely as the scene occurred at the time of its recording by the camera, although some or all the participants in the scene may have long since departed.

Upon the roof of the New York establishment of the company there has been erected a large movable stage for taking photographs of celebrated scenes from plays or of individual performances in which it is desired to reproduce the motions as well as the features of the subject. The details of the structure can be clearly made out in engraving No. 6. It consists of a floor of steel I beams which carries a series of three concentric steel tracks. Upon this rotates a massive frame, at one end of which is a stage supplied with the necessary scenery, and at the other end a corrugated iron house in which is located the mutograph. The stage is bolted to the frame, but the house travels upon a track and may be moved to or from the stage as required. The frame carrying the stage and house rotates about the smaller circular track located beneath the house, and may be swung around so as to throw the light full upon the stage at any hour of the day.

Our thanks are due to Mr. Herman Casler, the inventor of the above described apparatus, and to Mr. W. K. L. Dickson, the pioneer investigator in the art of moving photography, for courtesies extended.—*Scientific American.*

BABY'S PAP BY CARL WOLFF

SOME RANDOM NOTES. BY MILAN P. WARNER.

Use large focussing cloth about 4 feet square. Never talk to the photograph-man when his head is under the cloth.

Never untie the plate-holder loops ; slip them off and on.

To take silvered albumen paper off the solution (when floated for a sufficient length of time) in tray 19 x 23 (rubber or glass), use slat 20 inches long, with a rigid clip at each end.

A few hanging a while by screw hooks on horizontal line, wipe silver solution from lower edge ; then hang on another slat with clips to keep from curling.

We want to know the full range or scope of a manufacturer's products.

Universal Sensitometer Scale.

(For Everybody).

7.	Super-Sensitive
6.	Quick.
5.	Rapid.
4.	Medium.
3.	Slow.
2.	Very Slow.
1	

It would seem as if the idea of putting this scale on every box of dry-plates made would impress itself on the mind of every manufacturer.

It is of the very greatest importance to the user of plates.

Sometimes a person has to use a new brand ; packed lamp with red glass chimney and globe shade is best for changing plates. Portable lamp should be glass, so that oil can be seen, or may be of brass.

After an experience of twenty years as an outdoor photographer I wish to make this point.

The 9 x 11 inch dry-plates is the best size, and should be adopted by the United States Government.

The reversible back, back focus camera, with long extension of bellows, and high sliding front, with individual carrier for holding the plate-holder in place is the best in the world.

Head cloth should be waterproof cloth or velveteen ; not rubber cloth.

Gray is good color.

Pyro and potash developer is best.

No. 1.

Water	12 ounces
Sulphuric acid	1 dram
Pyro acid	1 ounce

No. 2.

Sulphite soda	5 ounces
Carbonate potash	4 ounces
Water	24 ounces

For use take

Water	10 ounces
No. 1	4 drams
No. 2	5 drams

Papier-maché trays

For plate 10 x 12 (or 9 x 11) feed in more alkali if necessary.

N. B.—Potash is the best alkali. Use no sal-soda for outdoor work. Use no ammonia in warm weather.

Combined baths are an invention of the devil ; not philosophic ; will not work to advantage.

Soaking the hands in cold poison is not the thing to do.

Every photographer should mix or dissolve his chemicals himself ; know what he is using.

If bought at a drug store the name and weight should be marked on every package.

Let chemicals have plenty of time to dissolve in cold water.

Toning bath and saturated solution of bicarbonate of soda should stand.

In making calculations always consider 480 grains to be one ounce.

The revolving back—back focus with individual camera to hold screen firmly forward against plate-holder, has no equal for field work.

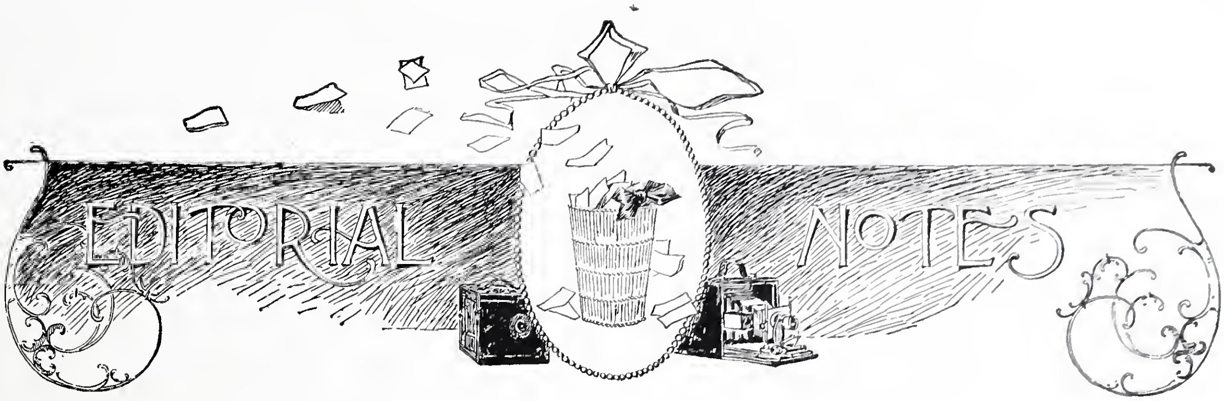
Sheets of silvered albumen paper (white) 18 x 22 inches, quartered, cover the negative plate.

Enameled bromide gelatine paper gives best detail in views.

Rough or mat surface paper is more suitable for portrait work.

Plate-holder slides should be held in place by loops and bands of tape or ribbon.

MID-DAY BY H. P. ROBINSON



EDITORIAL NOTES

Owing to an unavoidable circumstance we were only able to give 8 pages of the Encyclopædic Dictionary of Photography in our last issue. Our readers will find that we have made up the deficiency in this issue by giving 24 pages instead of 16.

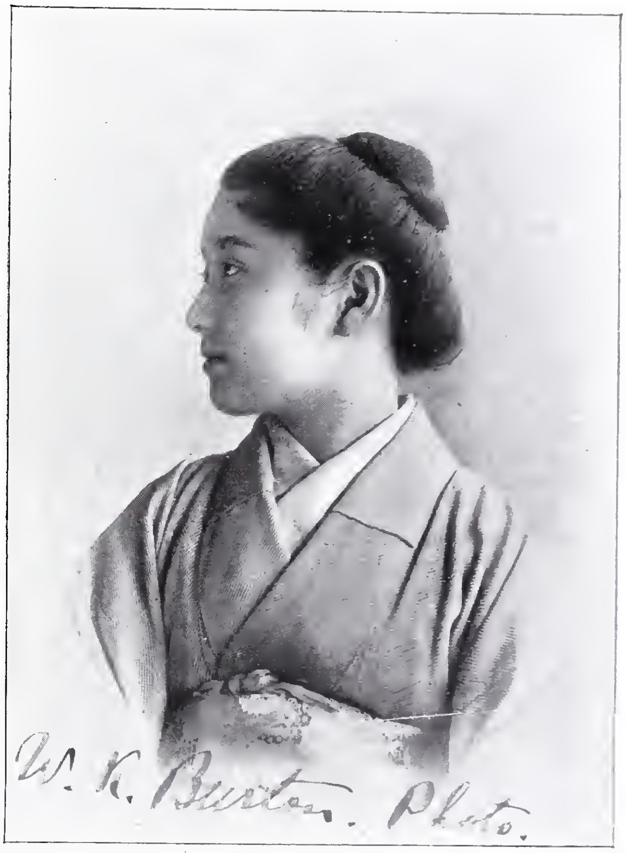
* * *

Mr. C. M. Giles writes: "We all know that the practice of photography is apt to be productive of surprises; but occasionally we have an experience that seems somewhat unique. Such an one fell to my lot recently. I was developing some 8 x 10 plates, when light struck streaks began to appear in the lower left hand quarter of each plate. Immediate investigations failing to throw any light on the problem of its probable cause, the search was given up as a failure, and the process of development resumed. Soon, however, the mischief-maker betrayed itself, and in a way, to me at least, very unexpected. An accidental turn of the left-hand that brought the palm uppermost revealed a strong play of phosphorescent light, and the mystery was solved A few minutes before I had handled matches with my moist hands, and thus the mischief was done. I do not know as any one else has a similar experience; but I send this as a warning in the hope that it may save others from repeating the annoying complication."

* * *

Prof. W. K. Burton, the well-known authority on all matters connected with photography, resides at Tokyo, Japan. He sends us the accompanying photograph and writes: "The photograph itself is far from being anything great, but there is some interest in it, in as much as it represents a *very* characteristic profile of the highest type of Japanese. The profile of a man of the same type would be very similar, but for moustache, etc.

Nobody knows where the Japanese have come from—the Japanese themselves least of all—but, observed merely from an ethnological point of view, there is no doubt, that the race is a mixed one, and that there are three distinctly marked types. The photograph I send you represents the finest type—that from which most (but by no means all) of the extraordinary energy, intellectual power, and *originality* of the Japanese people have come. I use the word *originality* advisedly, and in spite of the fact that the Japanese are sometimes summed up as merely skilful imitators.


W. K. Burton. Photo.

THE NEW ENGLAND CLUB'S FIRST CONVENTION.

The first convention of the Photographers' Club of New England, was held last month.

The meeting was called to order by the President, Mr. George H. Hastings.

"For many years," said Mr. Hastings, "the need has been felt of New England photographers banding themselves together for mutual improvement and benefit. In no way can we so well judge our own work as to see it by the side of others, and careful study and kindly criticism will incite us to better work than before."

Pirie MacDonald of Albany, N. Y. was introduced, and he had several practical suggestions to offer for the consideration of the fraternity. He made a plea for originality in photography. "Why," said the speaker, "should we copy people who push brushes?" And without having had special training in that direction. He ridiculed the idea of attempting to copy old paintings without knowing what it is that constitutes their beauty. He did not believe in removing every trace of truth from a photograph.

In conclusion Mr. MacDonald spoke of the need of a school of photography, and he said he hoped that with all our schools of art there would soon be established a chair of photography for the advancement of this art, or profession as he termed it.

Prof. John Ritchie, Jr., was next introduced, and after exhibiting several very successful photographs of the moon, which have recently been taken by two Paris astronomers, he spoke of the invaluable help which photography had rendered to the sciences. He referred briefly to the X-ray and stellar photography—the success in studying the spectrum. "The photographs taken twenty-five years ago," said Prof. Ritchie, "would not stand magnifying." He described the telescope used in Paris in photographing the moon, and with the aid of a magnifying glass it is possible to see the lines of the surface.

The next speaker was Charles Hetherington of Chicago, who agreed with all that Mr. MacDonald said. He hoped each member would extend the hand of fellowship in the advancement of photography.

The exhibits made are very interesting, showing the great progress that is being made and the various processes in use.

An interesting exhibit is made by G. L. Hurd, of Providence, who shows six portraits of old men from untouched negatives.

The exhibition was open to the public in the evening, and it attracted quite a large attendance. It is one of the finest displays in this line which has been seen in this city. The examples shown are of excellent artistic quality, comprising portraiture, genre subjects, views, backgrounds, and include all the paraphernalia used in the art of photography.

Among the specimens contributed to the exhibition is the exhibit by Rosch of St. Louis, which was awarded the first prize at the National Photographic Exhibition at Chatauqua, N. Y. Pirie & MacDonald of Albany show some elegant specimens of portraiture, and Hurd of Providence some excellent examples of the genre class.

The following is a list of the prize winners:

Grand Prize.—The Hastings cup. Two genre pictures, 11 x 14 plate or larger, subject to be chosen by the photographer. Won by E. F. Fuller.

Class A.—Six or more portraits, pictures to be from 11 x 14 plates, or larger; first, 8 x 10 Royal portrait camera box, value, $50; second, one case 20 x 24 Climax plates; third, diploma. First, H. Shervee; second, H. H. Pierce; third, C. W. Hearn.

Class B.—Twelve or more portraits, pictures to be larger than cabinets and smaller than 11x14. Frst, Darlot No. 3, anastigmat lens, value, $45; second, one case Stanley 11 x 14 plates; third, diploma. First, George Bolton. Only award.

Class C.—Twenty-four portraits, cabinets, or some of them smaller. Frst, Darlot 4x4 portrait lens, value, $35.50; second, 8x15 extension Packard background; third, diploma. First, W. J. Freeman; second, C. E. Shorey; third, D. Beckford.

Class D.—Competition limited to cities of 15,000 or under; 18 portraits 11x14 plates, or some of them smaller. First, 8x10 extension rapid Lloyd special lens, value, $38.50; second case 11x14 American plates; third, diploma. First, D. E. Rowell. Only award.

Class E—Competition limited to cities or towns of 5,000 or under; 18 portraits 8x10 plates, or some of them smaller. First, semi-centennial camera stand, value $25; second, 5x8 American plates; third, diploma. First, M. F. Libby; second, C. E. Brown. No third.

Class F.—Competition limited to towns of 2,000 or under. Twelve or more portraits, any size. First, Voigtlander Euryscope lens, No. 00, value $37.50; second, case 5x7 Stanley plates; third, diploma. First. C. S. Sherman. Only award.

Class G.—Landscapes, with or without figures, six or more from 6½x8½ plates or larger. First, 6½x8½ view camera box, value $25; second, Thornton Pickard shutter; third, diploma. First, W. G. C. Kimball; second, Tilton & Spuhler; third, C. E. Brown.

Class H.—Marines, six or more from 6½x8½ plates or larger. First, case 11x14 Climax plates; second, diploma. First, A. A. Latimer. Only award.

Class I.—Architectural, six or more from 6½x8½ plates or larger. First, case 20x24 Stanley plates; second, diploma. First. Whitney & Son. Only award.

Class J.—Portrait groups, two pictures from 8x10 plates or larger. First, case 14x17 American plates; second, 25x30 gold portrait frame; third, diploma. No award.

Class K.—Special prize for honorary members in the United States and Canada, outside of New England, one portrait from 11x14 plate or larger. First, suitable work of art; second, case 8x10 Climax plates; third, diploma. Judged by special committee. First, Pirie MacDonald; second, D. Hoyt; third, Mr. Steckle.

The judges awarded special mention to H. H. Pierce, of Providence, R. I., for a head of an old man. This picture was announced to be the *chef d'œuvre* of the exhibition.

A diploma was awarded to H. Shervee of Worcester, for the most tastefully arranged exhibit.

The annual convention in 1898 will be held in Boston.

The following officers were elected to serve the Photographers' Club for one year:

President, W. H. Partridge, Boston; First Vice-President, H. A. Kimball, Concord, N. H.; Second Viee-

President, H. H. Pierce, Providence, R. I ; Third Vice-President, G. W. Moulton, Rockville, Ct.; Fourth Vice-President, C. S. Sherman; Fifth Vice-President, W. C. King, Portland, Me.; Secretary, B. F. Kenney, Boston; Treasurer, Carl Horner, Boston.

During the two days' meeting 100 new members joined the club.

The convention closed with a banquet at Hotel Thorndike, which was tendered by the various firms who exhibited during the convention, and was complimentary to members of the club.

One hundred and one sat down to the banquet.

From 33 members last December we now have over 150.

There were 37 entries for prizes: 23 manufacturers, and dealers occupied spaces for display and sales.

It was universally admitted by many who had attended other State conventions that it was the most successful in every respect.

SOME REMARKS ON LANTERN SLIDES.

A Method of Developing—Partial and Local Toning. General Remarks.

[*Extract from "Camera Notes," Official Organ of The Camera Club, New York, Vol. I., No 2.*]

BY ALFRED STIEGLITZ.

The past twelve months of the Camera Club of New York will, without question, be known in the pages of its annals as the "Lantern Slide Year"; for in truth, as can be verified by the pages of the old journal, never before was there so much work done or so much interest shown in this most peculiarly fascinating branch of photography.

Slide making originated in the United States, it having been invented, as is claimed, by Langheim, of Philadelphia, some fifty years ago. It at once became popular, and continued to fascinate not only those interested directly in the production of slides, but old and young who simply wish to see pictures in an agreeable way.

Many of our best amateurs devote themselves exclusively to this branch of work, our Mr. Fraser being a notable example, notwithstanding the fact that most of the leading pictorial photographers of Great Britain and the Continent look down upon slide making as outside the "art limits," and therefore beneath their artistic dignity. It has become an accepted fact among them that the process is purely mechanical, and that at best the tonality of slides was incorrect. As for the declaration that slide making is purely mechanical, permit me say, that after a conscientious winter's work in this line of photography, I have come to a different conclusion, and claim that the technique of slide making *may* be quite as interesting as that of the known printing processes, even including the gum methods which are now coming into vogue. Of that more anon. As for incorrect tonality, in most cases that is due to the lack of knowledge and skill on the part of the slide maker, who has not given the matter enough study, or who perhaps does not quite grasp the material with which he is working. In order to properly appreciate a "picture slide," and in this talk remember I am only referring to "picture slides," the same must be shown under the exact conditions as prescribed by the maker, for the latter, if thoroughly at home in his work, will make his slides to suit the conditions of light and enlargement set down by him before he begins his picture. It is this factor that makes slide making so unsatisfactory and discourages the earnest worker when he sees his slide on strange screens and quarters. Suppose I made my slide to be enlarged ten times and shown with a light whose intensity is L, so as to give the desired effect, and it is then shown enlarged to 20 *l* and a light with an intensity of L, what is the result? Entirely false values and consequently a false impression. But does this not hold true of prints to a certain extent? How many gems are thoroughly ruined in exhibitions by poor hanging and still more miserable lighting. We see we must make the best of existing conditions, and only show our work there where we may expect reasonable attention to our intentions.

Standard of Slides in the Camera Club, New York.

The standard of the slides made in our club is high, for the judging on test nights has been unusually severe, even hypercritical, according to many members who do not understand the motives of the judges. Just criticism, though it may seem harsh at the moment, is exceedingly healthy for the welfare of the club. There is much, too much, back-patting in the ranks of photographers. Honest criticism from capable men ought to be sought, and, when given, ought not to be condemned as discouraging new talent and hurting the feelings of the spoiled children in the ranks. The judges appointed for the year judged slides for their quality, by which was understood the correct rendering of tone values in connection with the other technical requirements of a slide. "Clear glass for high lights and transparent shadows" did not constitute a perfect slide, as the old-timers imagine. A first-class slide, we will not speak of perfection, very rarely contains clear glass, the lack of tone in any part of it being a serious defect. On the contrary, we have seen instances in which a faint veil over the whole slide would have been a great improvement, the subject presented thus gaining in atmospheric delicacy and charm. It is well to remember that veil and fog are not synonymous in this case. Fog is always to be avoided in slides. A luminous body only should be represented by clear glass. We fully appreciate that our audiences nevertheless still go into raptures over the so-termed brilliant slide, by which is meant one lacking in all medium gradation; in short, a black and white one. Such a slide is an abomination to the refined eye, and fortunately our precepts are bearing fruit among our members, and will therefore in due season influence those who come in contact with them; that is, our audiences. A matter rarely considered by slide-makers is that of color, and we are therefore confronted with bright red snow scenes, glaringly pink landscapes, blue architectural interiors, etc., which, though perhaps beautiful in all other respects, are entirely ruined by this shortcoming. This defect is often due to the desire to obtain softness at the expense of color, for we all know that a soft slide is, as a rule, produced by a long exposure and a weak developer—the two factors which are also necessary in obtaining warm colors. In order to control the color of a slide without sacrificing its gradation and quality, it is often necessary to resort to special toning methods. It is upon this matter, and also on my own method of developing slides, that I wish to dwell. The slides made by me during the past year were all produced in the manner to be described, and by special request I give you my working methods so that any one may be enabled to obtain similar results.

MY METHOD OF DEVELOPING SLIDES.

Having given the plate a very full exposure, it is developed in the usual manner with any developer (I personally prefer hydroquinone), with the difference that development is not stopped until the image has totally disappeared when examining the plate by transmitted light. It is then rinsed under the tap as usual, and placed in the hypo bath until thoroughly fixed. Upon examining the fixed slide it will be seen that it is not only so thick that you can hardly recognize the picture, but that it lacks all gradation in being muddy and flat. But this condition is necessary for future operations, all of which take place in broad daylight. On a table place two white porcelain dishes. The one, which we distinguish by calling it A, should contain a one per cent. solution of ferricyanide of potassium, and the other, B, a very dilute solution of hyposulphite of soda and ferricyanide of potassium, say:

1. Ten per cent. solution of hyposulphite of soda.
2. Ten per cent. solution of ferricyanide of potassium.

For use, take 100 parts of 1 and 15 drops of 2.

These baths must be renewed occasionally, as they deteriorate in the light.

In each dish place a small camel's-hair brush and a wad of cotton, which latter may be shaped at will to suit the purpose for which it may be intended. If possible, have the table near running water, otherwise have a pailful at hand, as plenty of water is essential for the delicacy of some of the operations to be performed.

LOCAL REDUCTION IN ORDER TO BUILD UP TONE VALUES.

As before stated, in examining the fixed slide by transmitted light, very little of the image will be visible. In order to facilitate matters, bring the slide *directly* from the fixing bath *without previous washing*, into dish A, in which it will be gradually reduced. Stop the reduction as soon as the image is fairly distinct. This is done by plunging the plate into water, thus stopping all chemical action. The slide is still very thick and flat, but it is now in a satisfactory condition for local treatment and the ultimate thinning down to the desired density.

In this state the slide is placed in dish B, and local reduction by means of the brush is begun. This process must be very gradual, so that it be in our power to alter our relative tone values or gradation at will. You notice in this local application of the reducing agent we in reality have the reverse of brush development in platinotype printing, with even a much greater leeway. The process of producing slides by this method is highly interesting, for effects not otherwise possible can, with a little skill, be obtained.

It is by this method that some of those striking snow scenes, shown during the winter, were produced. Originally the slides of these were considerably overtimed and overdeveloped, and then reduced in the above described manner. Between every stroke or two of the brush, it is well to rinse the plate, so that the strokes do not show in the ultimate result. No brush strokes ought to be visible when the slide is thrown on the screen; if any be detected the slide is a failure and ought to be discarded. With a little skill and practice, this method is very simple and safe, and any one having succeeded in mastering it will never resort to any other method of producing slides.

Naturally, it is essential to know something of tone values, as the resulting slide might otherwise be ludicrous in its effect. This process of developing a slide is necessarily very slow, forcing being at no stage admissible, as it would insure certain failure.

THE USE OF FORMALIN.

In winter the gelatine is sufficiently tough to withstand this seemingly rough treatment, but in summer it is well to soak the slide before the brush reduction is begun in a very weak solution of formalin for about a minute and then rinse thoroughly. The solution used by me is 1000 parts of water to one part of formalin. Sometimes the resulting color of the slide produced in the above described manner is objectionable and possibly rather uneven. To overcome this defect, the slide must be toned in a suitable bath. Among the many experiments made by me, the following will interest you most:

TONING.

In many cases it is desirable to color a slide to a pure blue, or perhaps only a suspicion of blue. An absolutely reliable method to obtain this color is to use the following bath:

BLUE.

I.	Sulphocyanide of ammonium	200 grains
	Water	32 ounces
	Carbonate of soda (granular)	2 grains
II.	Chloride of gold (brown)	15 grains
	Water	1 ounce

For use take 2 ounces of I and 4 drops of II, always remembering to add II to I, and *never reversing* the operation. This amount of solution will tone at least one slide to a perfect blue. The toning bath, in order to work satisfactorily, ought to have a temperature of 72° to 76° Fahr. Using the bath at a lower temperature results in failure, as the toning proceeds too slowly and unsatisfactorily in other respects. A higher temperature will hasten toning, but the gelatine of the plate is apt to be attacked in a most disagreeable way.

To judge the process of toning, it is necessary to examine the slide by transmitted light, using daylight if possible. A thoroughly toned slide will have a pure blue color when examined in that way. According to my experience, it is advisable to tone reduced slides after they have been dried, especially in such cases in which only partial toning is to be used. As for the density of toned slides, let me say that those toned with the above bath do not increase in density perceptibly.

GREEN.

In order to obtain a green slide, the following treatment is best:

I.	Oxalate of Iron	20 grains
	Ferrycyanide of potassium	15 grains
	Water	32 oznces
II.	Chromate of potassium	5 grains
	Water	16 ounces

Bathe your slide, which in this case must be somewhat lighter than the desired result, in solution I. In this bath the color will turn to a dark blue. From this it is placed in solution II for a minute and then dried. When dry the slide will be a bright green.

Bartolozzi Red.

Bartalozzi red is obtained by using the following bath :

I.	Ferrocyanide of potassium (yellow prussiate)	15 grains
	Water	16 ounces
II.	Nitrate of uranium	30 grains
	Sulphocyanide of ammonium	150 grains
	Citric acid (crystals)	30 grains
	Water	16 ounces

For use, take 1 part of I and 1 part of II, and place your slide, which must be first thoroughly soaked in this solution. It will quickly assume a beautiful Bartolozzi red color. In many cases the whites are stained in coloring the slides in this way, and in order to remove the same dip them into

Carbonate of soda	15 grains
Water	32 ounces

for a moment, not longer, and the stain will disappear. After this operation proceed to wash.

Partial Toning.

In using the gold toning bath some beautiful effects of color may be obtained by so-called partial toning. These colors are obtained by dipping the slides into the toning solution for a short time and then examining them by transmitted light. The combinations of the original ground color of the slide and the partial deposit of the gold, which is blue, give us quite a range of purples, blues, reds, grays, blue-blacks, etc., the color depending upon the ground color and the length of toning. Many of the snow scenes, before mentioned, were treated in this way.

Local Toning with Different Baths.

While experimenting with the above-mentioned and many other coloring processes, it struck me to try and color slides by using these baths on one and the same slide locally. In order to succeed quite a little skill in handling the brush and the various solutions, as well as the water faucet, are essential. And even at that, most slides are apt to be spoiled by the colors running into each other. My mode of procedure is as follows : I take a dry slide, dip into water so as to simply moisten the surface of the gelatine, and then apply the gold toning solution with a small or large brush, as the occasion may require, to those portions of the slide which are to be colored to blue, and shades of the same, and also the blue-blacks and purples, all of which are obtained by the sulphocyanide bath. After these portions of the slide have been colored satisfactorily, an operation which is most trying to one's patience and nerves at times, the other portions are treated successively with the various remaining baths. In most cases the results are exaggerations and also crude ; nevertheless such a slide, especially from a chemical point of view, is of great interest. In certain instances, however, such local coloring or toning is of great effect and beauty, especially if the original ground color of the slide be kept and another color simply suggested in parts. Some of the Venetian scenes in which water, sky, and a few houses and gondolas make up the picture, treated in this manner, show up beautifully.

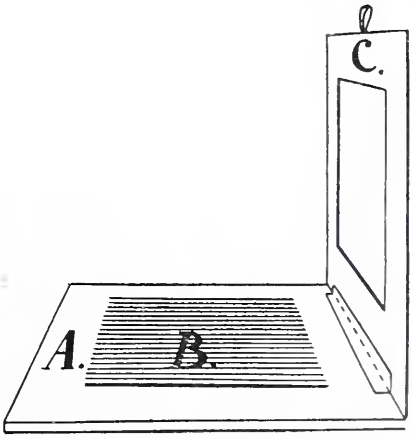
As a general rule the monochrome slide is preferable to those colored by any means whatever, especially for pictorial purposes. Nevertheless an occasional suggestion of color, if used very discriminately and with understanding, relieves the monotony of an evening's entertainment of slides, always remembering that by colored slides I refer to photographically colored ones, and not those tinted by hand with aniline dyes. Those can hardly be included within the limits of legitimate photography.

TO "BACK" PLATES QUICKLY AND CLEANLY.

Notwithstanding the fact that several plate manufacturers now send out their plates ready backed without additional charge, there are many who will prefer to perform this very important office for themselves, doubtless confident that no one can do it better. But those who have "backed" their own plates hitherto are probably not altogether unacquainted with such accidents as the backing medium creeping round on to the wrong side of the plate, red finger marks, and some spots and splashes on the film side, and so forth. The one important desideratum in backing plates is that the medium itself should be on one side of the plate, and that not the sensitive one. This may sound particularly simple in theory, but as practised in the dim light of a dark-room it has difficulties. It is claimed for caramel that it is most efficient for the purpose, but it has a nasty habit of running and sticking everywhere but the place it is needed in.

The sketch below will give an idea of a simple form of apparatus which can be made by anyone in a few minutes, can be packed in very small compass, and prevents any of the backing reaching any but its proper destination—the back of the plate.

A is a piece of flat wood, thick enough to prevent warping, in the centre of which and with a margin of about 6 in. is B, a piece of velvet or soft-surfaced material glued to it. B is cut the exact size of the plate used. C is a piece of card or mill board or thin wood of the thickness of a plate, and is the exact size of the board A, and has in its center a cut-out space, again the size of the plate in use. It may be hinged to A with a glued piece of material or leather. When C is placed upon A the open space in it is exactly over the velvet, B. Now as to the method of using : The plate, face downwards, is placed on B, C is brought into position on the top of A, and the back of the plate is presented for backing.



If the caramel is kept in a wide mouthed bottle and applied with a lightly rolled piece of cloth, like an etcher's tool for polishing plates, it can be easily rubbed on, and any slight superfluity goes on the card C.

Then lift up C and remove the plate and rear it up to dry. The whole process of backing the plates takes a far shorter time than to read this explanation.—*Amateur Photograph* (*English*).

THE HUMOROUS SIDE OF PHOTOGRAPHIC DEALING.

BY J. W.

The questions asked by tyros furnish the most prolific source of amusement to the dealer, and it sometimes requires considerable strength of will to prevent our risible faculties overpowering our ideas of courtesy.

The most frequent error of customers is shown in the case of the pronunciation of the names of the chemicals, a photographic dealer's shop often sounding as though it were a music store, when a customer asks for some harmonium bromide (ammonium bromide); and occasionally as a mechanical engineer's, when a pound of hydraulic acid (hydrochloric acid) is requested. (Is it because of its strength ?) All dealers must be familiar with incidents like these.

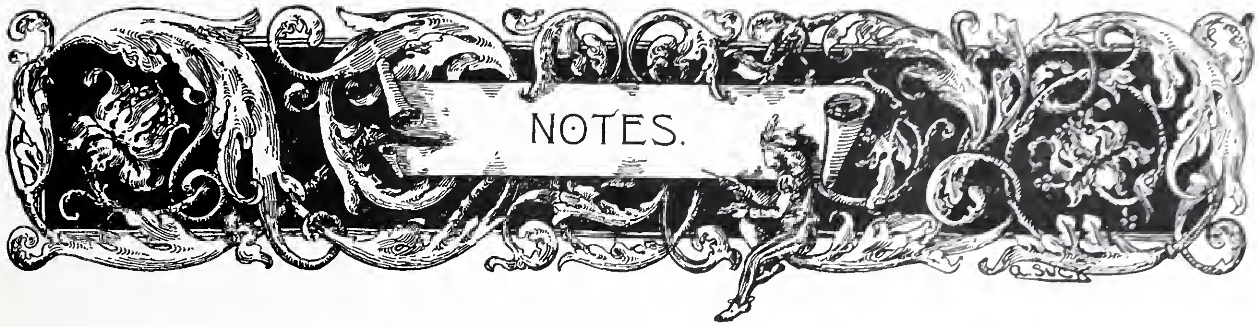
Then we have the business-like person whose knowledge of business methods is greater than the care he bestows in reading instructions. An amusing case of this kind came under my notice sometime since. I supplied a customer with a set of apparatus and materials, according to a list which was supplied to us and had been made out by a friend of the purchaser's. I was instructed to pack the goods and forward them to a given address, together with the invoice, which was duly carried out. Nothing more was heard until one day, a few weeks afterwards, the purchaser turned up at the shop with a pile of fogged negatives, or rather glasses, laid them on the counter and said, "Look here, all those plates you sold to me were bad, I've tried them, and so have several of my friends, and they all say that they are fogged." I told him that they were sold to him exactly as they were received from the maker by me, and then asked him if the packets were broken in any way when he received them. He replied, "Oh no, the plates were all right when I received them, because I checked the invoice myself, and counted them and they were all right, the proper number of boxes and 12 plates in every packet, without a mark upon them. They only went like this (holding up a fogged plate) when we placed them in the developing liquor." After this I had to explain the obvious cause, and he went out of the shop with the look of a man who had been injured innocently.

Not long ago a serious-looking person came into my place; he looked desperate. He was going to have this out if he swam in blood for it. I trembled. He laid a small parcel on the counter, and never said a word. I smiled, t'was all I felt equal to. Then he put his hand in his pocket, withdrew a small parcel and said, "This camera you sold me is a fraud. You told me that the pictures would be sharper with the little holes than with the big ones (diaphragms), and the thing does not work at all. You told me the other day that my plates were not sharp, so I put on one of the small holes (stops), and increased the speed of the shutter to take it sharper, and now I can't get anything on the plates at all. You'll just have to take the confounded thing back." After explaining to him that by the term sharpness I meant definition or clearness, and did not in any way refer to the speed at which a photograph could be taken, the worried look quietly passed away and he became almost happy.

Similar experiences to the above are common. Only the other day I advised a customer to use rapid plates, in a hand camera as the day was so dull, and he intended to take snap-shops; but was met with the remark that the camera was so-and-so's camera (naming a very good firm of dealers) and the camera was so quick that it only needed quite ordinary plates, in fact he added, "it's an instantaneous camera. When in this condition they are hopeless; sold him some ordinary plates "

A friend of mine, a dealer, told me some time ago of a very humorous question he was asked in the shop by a thin, timid-looking young man, who commenced by saying that "I'm sorry to trouble you (this is very rare), but I wish to take a photograph on Saturday and I have a half-plate camera but no lens. A friend of mine promises to lend me a lens, but it is only quarter-plate. If I only took a quarter-plate photograph with the lens, do you think it would strain the lens if I used it on my half-plate camera ?"—*The Photographic Dealer.*

Photography as a Riddle Solver.—Some of our older readers will remember, says *The British Journal of Photography*, well on towards half a century ago, the discussion as to whether the moon does really revolve on its axis, as was usually stated. This really is a scientific riddle, just about equal in calibre to the popular one, which asks whether any one can be said to go round a monkey on a pole, if, while the observer walks once round the pole, the monkey keeps twisting also, so as to keep his face to the pedestrian. Now the same puzzle is taking place about the rotation of Venus, and Herr Gümpell stated, at the last meeting of the British Astronomical Association, that it had struck him that photography might be employed to solve the question, by means, not of a continuous picture, but of impressions taken at repeated short intervals.



NOTES.

The Manhattan Optical Co. of Cresskill, N. J., sends us a copy of a neat little catalogue containing descriptions of the cameras, lenses and photo supplies that they manufacture. Every amateur should purchase a copy.

The Bausch & Lomb Optical Co. inform us that notwithstanding the fact that the American market is open to all the other licensees of the Zeiss patents, the sale of their Convertable Anastigmat Lenses has exceeded their anticipations and taxed their new plant to the utmost to keep up with the demand for these extraordinary lenses.

Apropos of the introduction of the new words "Rayfiltergraph" and "Rayfilterography," a definition may be in order for those who may not have been fortunate enough to have learned by experience the application of the terms. A rayfiltergraph is a photographic negative or print made with the aid of the rayfilter. Rayfilterography is the art of producing rayfiltergraphs.

Recent Experiments with the Rayfilter in connection with the Kodak have demonstrated that excellent results may be obtained on the film regularly furnished with those cameras. The Bausch & Lomb Optical Co., manufacturers of the bicromate of potash Rayfilter, have adapted a special filter so that it can be used on the Bullet Kodak. Every owner of a Kodak or film camera should send for the booklet "Rayfiltergraphs," Dep. H., above company. A copy will be sent free.

Solubility of Silver Chloride in Ammonia.—In a theoretical paper bearing upon the conditions obtaining during the admixture, under varying states of pressure, of ammonia and silver chloride, Mr. R. Jarry, in *Comptes Rendus*, gives a table of the solubility of silver chloride as follows:

NH_3	·145	·294	·560	·624	1·177	1·636
AgCl	·049	·136	·344	·400	·468	·518
NH_3	2·816	2·98	3·019	3·243	3·456	3·748
AgCl	·659	·709	·725	·587	·477	·39

The remarkable fact is here shown that, up to a certain concentration, increase of strength in the ammonia solution brings about an increase in the amount of chloride dissolved, but that, when a certain point is reached, any further strengthening of the ammonia leads to a decrease in the silver chloride dissolved.

Light and Shade.—It is well known to artists that an arrangement composed of strong lights and darks only, cannot have the essential quality of breadth. It will be spotty like a chess-board, for want of half tone to connect the extremes This effect is familiar to most photographers, and especially so when a strongly lighted subject is under-exposed, and still more so if this result be over-developed. Three chief factors should be remembered as affecting breadth of effect—first, the natural lighting and arrangement of the subject; next, an ample but not excessive exposure; thirdly, the development of a soft rather than vigorous negative.—*A. P. Note Book.*

Borax as a Restrainer of Development.—The addition of a solution of borax to any alkaline developer is said to exert a wonderful restraining influence.

The following strength is recommended:

Borax	30 grains
Water	1 ounce

One drop added to an ounce of developer is enough for slight over-exposure, a few drops will completely arrest development at any stage.

A Reducer for Bromide Prints which does not Stain.—An ounce of strong and fresh chloride of lime or bleaching powder is stirred in water, after which the liquid is filtered through paper. The bath thus obtained will not only reduce bromide prints rapidly, but will leave no yellowish tint, as is often the case with the ferricyanide and hyposulphite reducer. More than this, the chloride of lime will tend to clear away any tint on the whites; indeed, it will tend rather to harden the print by eating out the lighter tones. For certain subjects and effects this may be desirable; but if a slight action in this direction is objected to, the chloride of lime bath should not be used. A thorough washing is all that is required after the chloride of lime bath.

The above-mentioned solution is excellent for removing the yellow tint sometimes acquired by platinotypes, this tint being something quite apart from the true image of metallic platinum. For this purpose the bath may be made more active by adding a drachm of hydrochloric acid to each pint.

Largest Camera in the World.—An enormous camera has been constructed and is now being used in San Francisco. It found its necessity in the Fair will contest, and was conceived and built by Theodore Kytka, the artist and expert in micro-photography and chirography. Mr. Kytka, who was employed by McEnerney & Goodfellow to investigate the pencil will the day on which it was filed, believed the document to be a forgery. Charles Fair's attorneys, Knight & Haggerty, decided to take every possible means to establish Kytka's theory. So they built this camera.

With it an exact reproduction of any writing can be magnified 3,600 times. This means that a letter one-twentieth of an inch in heighth can be accurately pictured fifteen feet tall. In this way, photographing one minute section after another, the pencil will could be reproduced so that each page would be 3,000 feet wide and 5,100 feet long.

The results obtained were a revelation, says the San Francisco *Examiner*. Never had there been so elaborate a plant in this country or in Europe. The police employed this camera to assist in the Becker and Creegan case, where a check on the Nevada Bank was raised from $12 to $22,000. The first work to be done was to show that the check for $22,000 was a forgery. The process employed was as simple as it was effective.

The check was placed between two sheets of glass and in focus before the camera. It was then photographed, enlarged several times with a strong reflected light from behind, emphasizing not only the fibre of the paper but the lines on it. That photograph told the whole story. The camera brought out faintly the letters "lve" which had been erased with acid by the forgers before they changed the word "Twe-lve" to "Twenty Two Thousand." What was more, the ink in the first three letters was shown to be different from the rest. The photograph showed too that the original check had been blotted, while the letters that had been painted in were allowed to dry. The patches that had been used in filling the holes in the paper of the check made by the perforating machine were also made evident.

Coloring Prints by Partial Toning.—Dr. Rautert, of Mayence, read an interesting paper before the recent meeting of the *Verein Zur Pflege der Photographie und verwangder Künste* at Frankfort-on-Main on coloring prints by means of various toning baths, but without the use of color. The print is first washed to remove excess of silver, but this must not be carried too far or the print will tone very slowly. While still wet it is placed in a dish inclined at a slight angle and then is retouched in the shadows with a camel's-hair brush dipped in a solution of chloride of gold. Each portion of the image after retouching is washed in running water to avoid the solution spreading to the untoned parts of the print. After the shadows the chair is tinted, if it be a portrait; for red brown by the aid of a solution of chloride of gold, for deep brown with a more concentrated solution, for black with a solution of chloride of gold followed by chloroplatinite of potassium. Portions of the print requiring it are then toned gray or black with platinum. In order to give a much deeper black tint to the pupils of the eyes, the print is washed with water, then, after drying, except just round the middle of the eye, chloride of gold is applied to the pupil and the eyelashes. After the various tonings the print is fixed with hyposulphite in the ordinary way and washed. If the shadows between the hair and the forehead remain too red, they can be eliminated even after fixing by the application of chloride of gold. The coloring of the face is then proceeded with, using very dilute ferricyanide of potassium. A bronze medal has been awarded to Dr. Rautert for his interesting communication.—*Bulletin of the Photo-Club de Paris.*

An Important Point in Fixation.—Mr. C. Welbourne Piper brings a matter of interest under notice with reference to loss of density in fixation, in an article in the *British Journal* for the 29th ultimo: "In cases of normal exposure," he points out, "development is never carried as far as possible; consequently the film, when immersed in the fixing bath, must contain a considerable proportion of partially reduced silver haloids or subsalts, which will be decomposed by the hypo into metal and soluble normal salt; that is to say, metallic silver is reduced during fixation. If this reduction takes place in the presence of a haloid salt, a soluble haloid salt of silver may be formed, and metal lost that otherwise would go towards making up the density of the image. It is fairly obvious that loss of density in the fixing bath depends a good deal upon incomplete development. An under-developed film loses a great deal even in a plain hypo bath; while, on the other hand, an under-exposed film that has been subjected to forced development, loses very little. In the first case the development of the exposed particles is very incomplete, and a great deal of subsalt must be carried into the fixing bath; in the second case, the reduction of the few particles exposed is fairly complete, and very little subsalt remains. It therefore seems highly probable that loss of density is mainly due to the presence of subsalts in the film; or, in other words, to the reduction of metal in an extremely fine state of division during fixation." This explains why "hard" negatives become harder in fixing, and negatives with any tendency to "thinness" correspondingly thinner.

The Manufacture of Colored Screens.—In *Photographischen Correspondenz*, Dr. Eder gives some interesting hints about the making of colored screens. He specially recommends the gelatine preparation with colored collodion. The same concentration is given to the gelatino-chloride as is usual in the manufacture of plates, and a few drops of acetic acid are added in order to make the coating smoother and less liable to form streaks. This colorless coating of gelatine is allowed to dry on the glass plate, which is then dipped into the colored solution and after a short washing again allowed to dry. Picric acid is a suitable dye for light yellow; Manchester yellow is a stronger absorbent for blue-green. Orange yellow is produced by orange naphthol. Lastly, an orange-red tone can be obtained by erythrosine. It is recommended for golden yellow to fix together a picric and Manchester yellow plate. If it is desired to entirely do away with the blue-violet and the light blue, a plate of glass is dyed in picric, then in Manchester yellow, and lastly combined with another plate which has been dyed in β orange naphthol. Such plates give with erythrosine plates only, yellow-green; with fluorescent plates only, green. For cyanine plates, when only red and orange effects are desired, the orange-yellow plate is combined with one colored with a coating of erythrosine. For very fine work, as for example, three-color printing, the use of such glasses may give rise to a defect, in that they are not exactly optically parallel, and therefore alter the focus for each picture. For this work, the use of glass trays with glasses worked exactly optically is recommended.

Enlarged Negatives.—The whole success of the method of making an enlarged negative according to G. Haumer Croughton, depends upon the transparency, and the reason he assigns for so few photographers succeeding is because they do not realize that the transparency must be what most would call over-exposed and over-developed. A transparency which would be all right to hang in a window with a ground-glass backing would not yield a good negative. It must be covered all over, except the very highest lights, and must have unbroken gradations from top to bottom of the scale of tones, no bare glass except a very limited number of the highest lights in the picture, and these must be led up to by fine gradations. In using dry plates for this work choose a slow plate, and preferably a plate that can be used with an oxalate developer. You will get a much cleaner transparency, and the color will be much better for reproducing the negative from. If the transparency should need strengthening it can be done with bichloride of mercury followed by ammonia. But be *sure* to *varnish* your negative. In my experience I found that it was best not to make the transparency too sharp. Do not use too small a stop in the lens, and if the grain is too coarse turn the lens out a little *away* from the ground glass. This is important, as if you turn the lens in *towards* the ground glass the effect is very different. This will soften and make indefinite the coarseness of grain which is seen in all enlargements, and enable the retoucher to do his work better, and loss of sharpness can easily be remedied by the pencil, working around the eyes, developing the pupil, defining the line round the outline of the ball, the line of the lash, eyelid, etc.

How to Imitate Oil Paintings.—To take a photograph direct from life that, when painted, has the appearance of being a copy of an oil painting, and to do it without retouching the negative or any extra trouble in printing may seem to those who are unacquainted with the method an impossible operation. It is, however, a very simple one, and involving as it does, the use of no accessories not ordinarily found in the house, those who wish to experiment need not be at a loss for the means.

The effect is accomplished in the following way. For the best results, stretch a piece of white Russian crash on a board, clothes-horse, or stretcher, if one is handy. See that there are no wrinkles; it must be stretched perfectly smooth. Now place this screen, which may be of any convenient size up to a yard square, in a good light where it will receive even illumination; place the camera before it and obtain a sharp focus upon the texture. If the picture is to be as small as cabinet size, place the camera at such distance from the screen as will reduce the size of the grain or weave, but if it is to be 8 x 10 or 11 x 14, it is better to take the grain full size, or even a little enlarged, all of which is easily accomplished by placing the camera nearer or farther from the screen, and extending or reducing the distance between lens and ground glass by means of the bellows.

The focus having been obtained, insert the plate-holder and expose sufficiently, being careful, however, not to overtime it, as the plate has still another exposure to receive after this.

This much having been accomplished it only remains to pose the subject before a white and evenly illuminated background; a sheet with all the creases ironed out will do nicely, and take the picture in the usual manner. As the speed of the plates is slightly increased by the preliminary exposure on the white screen, some little allowance may be made.

Upon development the face will be found as nicely smoothed as though retouched, a faint hatching being barely perceptible if both of the exposures were properly timed. The background will have a pronounced grain like one gets in copying a painting, and in the dark parts, a black dress or coat for instance, this grain will be but faintly visible, the dark values having almost completely eliminated any traces of the first exposure.

The negative after drying is ready to print, and according to its density should be printed either on matt-surface aristo or platinotype paper, and will be found not only a curiosity but an exceedingly beautiful picture, well repaying one for the slight extra trouble expended to produce this effect.—*Cycle and Camera*.

Changing Plates.—A sheet of non-actinic paper may be easily carried without increasing bulk or weight, and this may be wrapped round an ordinary candlestick and the lantern extemporised.

The reflected light coming out of the top and thrown on to the ceiling will not matter. Indeed, it may be found by experiment that plates may actually be changed by reflected white light, but, of course, if they come in contact with a direct ray the result is fog.

If the paper, therefore, has been left at home, and this is probable, as it is so simple, the best plan is to get an ordinary candle, and place it lighted in its candlestick in the fireplace. Then if a sheet of newspaper be placed in front of this, the light is sufficient for changing purposes—if you don't dwell on the matter.

In the daytime it is useless attempting to extemporize a dark room, for rays of light will probably be discovered in every cellar and outhouse, with the exception of the coal-house, which is a little too dusty. But plates may be changed in one's bed, putting the slides well underneath the clothes to open them, and emptying all before the refilling is commenced. Gum the plates all together with strips of paper, and then place the full plate-box underneath the clothes, empty it, and put the exposed plates in, and replacing the lid, bring it out. Then put each slide under in turn and fill it. Finally replace the balance of unused plates in the box and the trouble is over. It is certainly a hot, tiresome process, but it is not so hot as being locked up in a wardrobe with a friend outside between you and suffocation, nor as tiresome as that lingering fear that the changing place which you have used was not safe, and that your plates are already, before exposure, fogged.

The Dim Light from a deep ruby lamp is depressing enough to many a poor prisoner of the dark room, and it is not matter of surprise that the knowing ones of the photographic fraternity affect the more cheerful rays of orange and canary—safe enough if of the proper tint. Some time ago we noticed some experiments made by certain enlightened medicos in relation to the cure of disease by the use of "baths" of colored lights, drawing inferences therefrom of fact and fancy.

But a French physician, like the true gallic cock, goes one better. He finds that by placing a melancholiac in a room papered with bright red, and whose windows and doors share the same inspiring color, the mopes and dumps disappear in a few hours, albeit the patient had suffered from them for months previously.

Yet another case. A lunatic who had become reduced to little more than skin and bone through obstinate refusal to take food, was subjected to the same treatment. The following morning he shouted for breakfast, and the asylum cook could not prepare it fast enough for him.

Another and unruly subject was placed in an altogether violet chamber, violet being, as we all know, the color of depression. Hence " the blues." In twenty-four hours he was quite tame.—*The English Amateur Photographer*.

A Substitute for the Lens Cap.—The cap of the lens is very easily lost when one is tramping about the country in search of the picturesque, and very often the loss is regarded as a serious one, involving much searching of mind and exercise of ingenuity to find a substitute. But it is really very easy to do without it. So easy, indeed, that in some cases, the cap having been lost, it has never been replaced, the make-shift being actually preferred to the convenience which it was used to take the place of. At the last moment, before drawing the shutter of the dark slide, the focusing cloth having been wrapped over the camera as usual, fold one corner of it into a little wad around the fingers, and hold firmly in contact with the lens hood. Draw the slide, and the right moment having arrived, make the exposure by simply raising the hand an inch or two, and then cover the lens again in the same way, while the shutter is replaced. It is quite possible to make so-called instantaneous exposures in this manner, of quickly-moving objects; indeed, it is quite astonishing how very rapidly the hand can be moved to uncover and cover again the lens, and the dodge should be tried by those who find themselves unable, when afield, to photograph certain coveted subjects, owing to the fact that they have left their instantaneous shutters behind.

Quick-Printing Negatives.—Owners of yellow negatives will do well to bear in mind that they may be made into quick printers by giving them a blue tint. In the dull days of autumn this is a decided gain. A few minutes' immersion in a strong sulphocyanide toning bath will usually give the desired result. The following strength is advisable:

A.

Ammonium sulphocyanide	30 grains
Dissolved in water	2 ounces

B.

Gold chloride	2 grains
Water	2 ounces

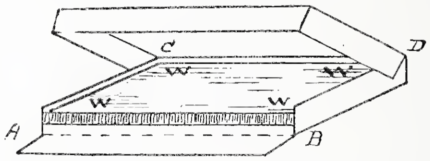
Add B to A.

This will be sufficient to tone several half-plate negatives.

Stoppers.—It is worth while, to avoid stoppers of bottles fixing, to give them a slight coat of vaseline from time to time. If, however, one has stuck, it may be removed by pouring a small quantity of oil round the inside of the rim, and then placing it before the fire until it is thoroughly warmed, when the stopper may be gently screwed round; or the bottle may be placed in hot water and the same course adopted.

Brushes.—Very useful brushes for the application of mountants, reducers, restrainers, or for use in the glycerine and oxalate development of platinotype prints, may be made by cutting off lengths of glass tubing and stuffing into one end a piece of sponge. The tubing can be obtained in long lengths at any chemical material dealer's, and is cut by marking with an ordinary file, and then snapping smartly. Afterwards the edges can be smoothed off in a gas flame. The brushes should be about six inches long and half inch in diameter. From time to time the sponges may be taken out and thoroughly washed and then replaced.

Printing Papers—a Convenient Method of Storing.—Several of the ordinary silver printing pppers have a tendency to curl up, so that it is a convenience to keep them flat, and at the same time cut up into suitable sizes easily get-at-able. The following contrivance has been proved by the experience of several years to be eminently satisfactory. An ordinary "lid" plate box is taken, and along two edges of the lid a slit is made. The part that now hangs free is attached to a corresponding edge of the bottom of the box, by means of glue. The hinge edge so formed as at C D in the accompanying figure is also strengthened by a strip of calico glued down along the hinge edge, outside, and so not shown in the diagram, though its position can be imagined outside the junction C D. In the same way the two opposite edges of the bottom are slit up, so that the front edge, A B, may hang down flat. This hinge edge, shown as a dotted line, is in like manner strengthened by another strip of calico glued on outside the box edge. The paper cut up is stored in envelopes (with only a narrow flap part) made of a stiff, shiny, red material, rather like that sometimes used for blinds. These retain their stiffness for a very long time. To keep all flat, three or four old negatives are neatly wrapped up in brown paper and form a weight, as at WWWW; the envelopes containing the paper being under this weight with the narrow flaps easily get-at-able. The flap of the box A B is raised up before the lid is shut down, and thereby kept in position. It will be found that most, if not all, silver papers keep longer if kept face to face, *i.e.*, sensitive side inwards. When any sheets get discolored beyond possibility of use, do not throw them away, but keep them for the outside sheets facing the good paper between them.—*The Amateur Photographer* (England).



Cupric Nitrate Printing.—The following writes "Jacob," in the *Photographic Life*, is an easily worked process, giving good results:

Take any kind of paper; if unsized, it may be sized in a bath of

Arrowroot	160 grains.
Water	20 ounces.

Then it is floated on a bath—

Uranic Nitrate	40 grains.
Cupric Nitrate	8 grains.
Water	1 ounce.

This operation should be performed in the dark-room, also the drying.

The printed image is faintly visible, as in the case of platinotype; experience will soon tell how far printing is to be carried. The image is then developed by floating the paper on a solution—

Potassium ferricyanide	20 grains.
Water	1 ounce.

This gives an image of a warm brown color, which is fixed by a thorough washing in running water, or black tones may be obtained, after a slight rinse, by floating on a bath—

Bichloride of platinum	4 grains.
Water	1 ounce.

Remarkable Photographic Effects from Fireflies.—The ninth volume of the *Journal of the College of Science*, Imperial University, Tokio, contains a very remarkable account of some photographic experiments with these insects by Mr. H. Muraoka, Professor of Physics, at Kyoto. He placed from 300 to 1000 of the flies in a flat box, and confined them in their place by a linen net. A dry plate, having in contact with it a variety of objects—plates of various metals, cardboard, thin wooden boards, &c.—was wrapped in severals folds of black paper, and, after being placed in the box with the fireflies, left there for two days. The plate was then developed, and distinct images of the objects were produced. The conclusions arrived at by Professor Muraoka are: (1) The light from the flies behaves like ordinary light; (2) the light contains rays that pass through cardboard, metal plates, &c.; (3) when the photographic plate is covered by layers of cardboard, it presents an appearance which calls to mind the permeability of iron to "magnetic lines of force"; (4) the properties of these rays appear to be influenced by the materials through which they have passed, perhaps by the thickness of the materials; (5) the properties possessed by the radiations as specified in No 2 are apparently non-existent, or at least, undiscoverable, until after "filtration" (the Röntgen rays are similarly undiscoverable until after "filtration," *i.e.*, through the glass of the Crookes' tube, and "filtration" may perhaps afford a means of rendering the X rays homogeneous); (6) the "filtered" firefly rays can be reflected. We have not the original communication by us, the above description being an abstract from the *Lancet's* account, but it does not appear impossible that the action may arise from some cause external to the fireflies, as, for example, the influence referred to on previous occasions, whereby apparently an electrical discharge gave images of the relief matter on coins, medals, &c., a subject again taken up by Mr. James I'Anson in last week's *Nature*.—*British Journal of Photography.*

Effects of Electrical Discharge on Photographic Plates.—Mr. I'Anson now considers that the wire-skeleton radiographs, recently described by him in the *British Journal of Photography*, are not electrically produced, but are brought about by the "unequal loading of the film with silver particles, which set themselves in the pattern shown when the film is raised to a temperature near boiling point." In his latest experiments, Mr. I'Anson, to test Professor Smith and Mr. Sanford's theory of electrical radiation being the cause of the coin images, performed the following experiments: "I have placed a sensitive plate between two sheets of ebonite about one-sixteenth of an inch thick, which were placed upon a brass-face plate, and a coin laid on the upper ebonite plate. The positive pole of the coin was connected with the brass plate, and the negative with the coin, and current passed for about two minutes. On development, an image of the coin came out showing the design and a radiating halo but out of focus and somewhat blurred, as might have been expected, as the coin was separated from the plate by the thickness of the ebonite sheet This seems to point to some other action than the luminous discharge, which was plainly visible on the upper surface of the ebonite round the coil."

Mr. Crookes on the Physiological Effect of Roentgen Rays.—Mr. Crookes, in the *Comptes Rendus*, of the Paris Academy of Sciences, referring to the painful effect produced on the hands, etc., of some persons exposed to the rays, states that he is inclined to think that the very energetic action sometimes observed with these rays depends, up to a certain point, on the idiosyncrasy of the experimentalist. He himself, though, as he states, he has been exposed to the action of the rays for a longer time than most experimentalists, has experienced no effects either upon the face or hands. At the same time he points out that he has witnessed in others very marked physiological effects. Our readers, who are familiar with the use of bichromate of potassium will readily understand how easy this variety of experiences could exist, seeing that one man may dabble with impunity all day long in bichromated water, while another suffers from a violent eczema if but a small quantity of such solutions is used for a short time only.

Kites for Observations in War.—We find that the suggestion we made some time ago as to the use of kites as a medium for taking photographs of the enemy's position during war time is now a realized fact. According to the *Daily Mail*, Captain Baden Powell has, by the aid of a kite, ascended a considerable distance in the air, and from there made observations. He says: "One of the most important of the uses to which a kite can be put is photography. If a camera could be suspended high in the air, so as to take a picture of what is underneath, it would be of inestimable advantage for the purpose of discovering guns in a hostile fort, also for the making maps of unknown ground" Captain Baden Powell produced a wonderfully distinct picture of a house and grounds from an altitude estimated at 400 feet, and every path, fence, and wall, was clearly shown. "At present I use a camera, the shutter of which is released by the burning of a slow match;" but he is having a clock-work arrangement made, by which he expects to be able to take half a dozen consecutive pictures at regular intervals of time.

The Gum Bichromate Process in Three Colors.—Ritter von Schöller, whose charming little picture was medalled at the last Pall Mall Exhibition, has been using the gum process for producing three-color prints, and gives in the current number of the *Wiener Photographische Blatter* some details of his method of working.

For the yellow plate he uses a cell filled with equal parts of solutions of methyl violet and rhodamine, the strength of which is not stated, but must be found by trial and error ; as red, blue, and violet should not print, these colors must be opaque in these places, and he used Albert's emulsion "eos," and added ten per cent. dye of the R. P. sent out therewith, but Lumière's red sensitive plate may also be used.

For the red-printing plate a yellow and green sensitive plate should be used, and a filter of cupric chloride with some sulphate of copper.

For the blue plate a solution of aurantia, or a dark aurantia dry screen may be used.

As pigments, Milori blue, gamboge, and Munich lake were used, and applied to the papers with bichromated gums, and further treated as has lately been described in these columns. The process is practically the same as that about three years ago published in the *Photographische Correspondenz.*

Herr Walzek, who has also been working this process, uses an ordinary plate without a screen for the yellow plate. The red-printing plate is made behind a Lumière dark yellow screen, with a Lumière A or Edwards plate. The blue-print plate is made behind a copper-red glass screen, and on a red and orange sensitive Lumière B plate. Walzek uses the same pigments as Schöller, but coats his paper with a two to five per cent. aqueous solution of shellac.

Hints to the Photographer in Dark-Room.—See that the room is perfectly secure from white light ; look to the fireplace, if there is one, and the chinks under the door ; if there is a skylight temporarily covered with some material, see that it is tacked down closely and not allowed to flap with any wind. Work with clean dishes, glasses, and hands. Clean all dishes after use and rub dry or leave in a rack to dry. Keep one dish for hypo and renew the bath frequently. Tidiness in a dark room will reward the operator handsomely. For development, have all bottles labeled clearly and within reach of hand ; have a solution of bromide of potassium close to your side. If expecting over-exposure, work with less of No 2. Let measuring glasses be clean and beware of those with broken bases. Have a lamp that burns well and does not smoke. Have as much ventilation as is possible. Do not fix a plate the moment the detail has appeared ; beware of this, especially in rolls of films ; obtain good density. Have as much clean cold water as ever you can. If not laid on, have several buckets, rinse well in various stages. Do not leave a finished negative in a black dish in a sink where there is a hot-water tap. Start with a weak light at first, and remember that a minute is a long one in a dark-room.—H. L. in *The* (English) *Amateur Photographer.*

The Twentieth Free Art Exhibition will be held in the galleries of the Bridgeport (Conn.) Public Library, from Oct. 16th to Nov. 27th, and will include a special section for a display of photographs taken by cyclists awheel. Contributions of photographs framed or simply mounted are asked from all wheelmen. Exhibits will be returned promptly, without expense to exhibitor. Address W. J. Hills, Superintendent.

The Well-known Voigtlander Lenses, both Portrait and Euryscopes, as well as the now famous Collinear Lenses, have been slightly affected by the new tariff; but in justice to the importers and American agents—Messrs. Benj. French & Co., of Boston, Mass.—it must be said, that the increase of the retail price is no more than the increase in the duty.

The photographers need not be told that the above named firm has always had at heart the interests of the fraternity, and have done all in their power to keep the duty on imported lenses, such as they have handled for over fifty years, down as low as possible, and that the are not in the least responsible or desirous for the increase of duty.

The above remarks apply also to the popular and genuine Darlot lenses, also imported for the American trade by Benj. French & Co., who are prepared to send a revised price list of their lenses on application.

Duplicate Negatives and Direct Positives.—In No. 398 of *Photography*, a full account was given of Balagny's method of making direct duplicate negatives without the use of diapositives. That the plan recommended gave perfect results there could be little doubt, and, on the principle therein laid down, direct positives, instead of negatives, have been made in the camera for employment in certain mechanical processes. Professor Namias, however, now claims to have gone beyond this. So far as the exposure of the plate in the camera and the manner and extent of its first development are concerned, there is practically no difference between the courses suggested by Balagny and Namias. The plate is fully exposed and developed slowly with a hydroquinone developer until the deepest blacks have fully penetrated the film, and the picture is plainly seen on the reverse side; after which it is thoroughly washed to remove the developer. Instead now of making the second exposure, and then transforming the silver reduced in development into a chromate, Prof. Namias suggests the prior application of the bichromate bath. For this purpose, he employs a solution of 150 grains of potassium bichromate in 34 ounces of water, rendered slightly acid by chromic acid, which does less harm to the film than nitric or other acids. After the plate has been immersed in the solution, the dish containing it is taken out of the dark room, and bright diffused light is allowed to act until the black image produced by the developer is completely changed to a bright yellow, the color of silver chromate. No change takes place in the unreduced silver bromide, which remains as it was left by the developer. Now comes the peculiarity of Dr. Namias's method. Having discovered that sulphite of soda is a perfect solvent of chromate of silver, while it practically leaves untouched silver bromide, he hit upon the idea of using it for the removal of the primary image, and then reducing by the usual means the bromide left on the plate. When the silver image has been completely changed to a chromate, the dish is carried back into the dark-room, and the plate is there thoroughly washed. It is then immersed in a solution containing about five ounces of sulphite of soda in thirty-five ounces of water, and left there till the chromate of silver image is entirely eliminated. In a few minutes nothing remains save the bromide of silver that has hitherto been unacted on by light. The plate is then removed from the sulphite solution, washed and exposed for a few moments to the light given by a match, which impresses the silver bromide. It now remains only to blacken the bromide to obtain a perfect negative or positive, according as the object photographed was a negative or a positive. Obviously, the blackening must be effected by one of the reagents known as developers, but it will be generally found that the diverse treatment to which the plate has been subjected renders the developing action somewhat difficult The solution best adapted for reducing is made up of:

Amidol	5 grammes or	77 grains
Sulphite of soda crystals...	40 grammes or	616 grains
Water	1000 grammes or	34 ounces

Should this fail to sufficiently blacken the bromide, washing in a weak (1 to 1000) solution of bromine and resuming development will soon put matters right. As fixing is a superfluity, once the bromide has been sufficiently blackened, a simple wash in plain water completes the operation. If the various stages have been carefully followed, the plate should show a clear, bright image; but if, owing to insufficient first development, there be a veil, which is inimical to good results, it may be removed by a weak reducing bath containing one per cent of potassium ferricyanide to five per cent of hypo. A slight fog does not much matter, and might be left alone.

The Photographers' Association of Ohio, can congratulate themselves on the immense success of their seventh annual convention and exhibition, which was held on August 31st and September 1st at Columbus, Ohio.

The convention was called to order Tuesday morning, August 31st, by President Geo. B. Sperry, of Toledo. The beautiful assembly hall on the seventh floor of the Great Southern Hotel, where the convention was held, was well filled when Hon. Gilbert Stewart, President Board of Trade, was introduced to deliver an address of welcome. Mr. Stewart made a very pleasing address, and was heartily applauded.

On motion, the reading of minutes of former meeting was dispensed with.

President Sperry's annual address —

President Sperry's Address.

Ladies and Gentlemen and Members of the Photographers' Association of Ohio: Perhaps I should apologize for the length of this address, and perhaps, too, for the tenor of it. It is pleasanter to hear that our art is sailing smoothly and proudly into the haven of our desires, to believe that our association is on the crest of a tidal wave that nothing can arrest. I might talk glibbly of the artistic advancement of our profession, and I could find much to encourage such a theme. I might point proudly to the past achievements of this association and predict a succession of triumphs for the future, but I should fail in what I consider my most important duty if I did not call your attention to some of our deficiencies and suggest a remedy. Our method of conducting our business meetings, or rather our lack of method, deprives us of much of the benefit they might give us. We are very poor legislators. We haven't the courage of our convictions. We allow measures that we cannot endorse to go through for fear of arousing enmity. We lack that fine diplomacy that makes us combatants on the floor and friends in the lobby. It was suggested by one of the spaakers at Celeron, Mr. Bellsmith, I believe, that the members form two parties and contest the elections. This is an excellent suggestion, and we are in good shape to put it into practice. I heard a member allude to some others who are known to advocate extreme views in lighting as the portrait painters. Some of our best workmen do not believe that these extreme views represent legitimate photography. Here is a chance for opposition, array yourself upon one side or the other. If the nominating committee do not put on the men who represent your views see that they are put up and work for them.

For several years we have had the benefit of the best art instruction that could be secured, but heretofore too little attention has been given to technical demonstrations. It is to be hoped that your presence this year at the sessions of the school will encourage those who are giving their time and their knowledge for your benefit. We cannot as professional photographers afford to let our instructions be one sided. Artistic excellence can never supply the the deficiencies of technique. The untidiness of the displays has been a matter of comment among those who understand the value of environment. The setting of a portrait is so important a matter that I earnestly beseech you to give it more careful study. A better knowledge of colors and their complements and a taste for restful tints would soon do away with the conglomeration of effects that distress and bewilder the eye.

I should like to see this association do something to better the social standing of the photographer. The lawyer or the doctor is accorded a standing in his community by reason of his profession. The photographer has none save what he acquires through his own personality. This is not as it should be. Isn't it a lamentable fact that the lawyer whose success ofttimes depends upon his ability to misrepresent and deceive, whose notoriety is too often gained by his championing the cause of injustice, and even of fraud; isn't it lamentable, I say, that he should be ranked higher in the social scale than the photographer who can best achieve success through his culture and refinement, whose profession fosters and encourages the cultivation of those graces that are beneficial and ennobling. I quote Mr. Bellsmith again in saying that the habit of keeping our places of business open on Sunday has much to do with our social position. We cannot make any advancement until we arouse some opposition to this degrading custom. I do not believe that legislation is the remedy, at least not as an initiative step. Educate the man, his self-respect will do the rest.

The general business depression which has been gradually settling down upon us since 1893, has apparently reached its turning point and we can look forward with some confidence in the hope that the fall trade will prove a business revival for us. The extremely poor business of the last six months has raised the query as to whether or not the demand for our products was not dying out, and if so, what is to be the future of photography. This is a pessimistic view scarcely worth considering and by no means warranted by the facts. People are ready as ever to spend their surplus dollars for whatever interests them. If the dry goods merchant or the jeweler can interest them more than the photographer they will get more of the dollars.

To what extent is our lack of business due to lack of enterprise? If it be necessary for the merchant to expose his wares in never ending variety and to use every means at his command to draw customers, is it necessary for the photographer to pursue the same course? To dispose of our products must we absorb the commercial spirit of the shop? On the other hand, can we rely upon our professional dignity for support? To the artistic photographer the petty methods of the bartering salesman are very repugnant, but should he try to deal with the public as an artist he must bear in mind these two facts: 1st, the portrait painter's patrons are a very small per cent. of the community. Their yearly number would scarce give the photographer a week's business; 2d, when a photographer makes a practice of furnishing more than one print with his negative he enters the ranks of the manufacturer and gives them a commercial rating more or less dependent upon the value of the raw material and the cost of production, and make it impossible for him to bear the same relation to his patrons that the artist enjoys. Shall we avoid both extremes and keep in the middle of the road? I do not believe in dodging an issue, but I dare not draw the line. This is a serious question and deserves your most serious consideration.

There has been some discussion as to the advisability of uniting the National and the different State associations in such a way as to allow the State two years for convening and the third year for the National alone. This seems at first thought a fair way of disposing of the question of too many conventions, but a further study of the matter has led me to doubt the wisdom of such a step. To give the National but one meeting in three years, would, I fear, mean its final disruption. We need a National Association to give the profession at large stability and character. At Celeron in '96 and again in '97, were gathered together the largest body of photographers that were ever assembled. This, too, during the dullest times that they have ever known. What has aroused this great interest? For several years the State societies have been industriously distributing their leaven. It raised the attendance at Celeron. To interest a man in his local society is to give him a craving to see the greater convention.

The awarding of prizes has been a fruitful theme for discussion, some contending that as many as possible should be given as it brings more entries and produces more interest than any other feature of the meetings. On the other hand there are those who condemn the practice. There can be no question but that there has been a too general distribution of medals in the past. It cheapens their value and takes away the incentive for competition. If every member of this organization came to the meetings with the sole purpose of advancing the interests of the association and of doing his duty at all hazards we would not need to spend money for medals. The sense of duty will never support this association, nor does the association want you to come from a sense of duty. It cannot hope for your support.

A permanent home for our association may appear to you to be a subject that has been worn thread-bare with no tangible results and it is perhaps unwise at this time to take any action in the matter; but I cannot forbear calling your attention to the urgent need of a permanent exhibition room for our Salon collections We cannot hope to retain these valuable pictures intact unless we provide a place for them. I need not urge their value for public exhibition. It is apparent to all. If Columbus cannot furnish us sufficient wall space for this purpose, I think we had better shake her dust from our feet. The admission of last year's Salon pictures to the spring exhibition of the Cincinnati Museum of Fine Arts, and the very generous notice given them by the press of that city is a public recognition that there is art in photography and to permit this collection to be packed away a possible prey to mice and mildew is a disgrace to the association and an insult to the men who have worked so hard to make our Salon the grand success that it is.

The stand this association has taken in the matter of the higher education is deserving of the heartiest commendation and we take no little pride in the fact that we are acknowledged leaders, and not only do the different State societies look to us for example, but even the National is copying our methods. To those who heard Prof. Beck last year I need urge the importance of the illustrated lecture which is to be delivered this afternoon in this room. Mr. Beck holds that the art of the portrait painter and the art of the photographer are essentially the same and that the best school for the photographer is the modern portrait. We will endeavor to show wherein the photograph of to-day fails to meet the requirements of the artist and tells us how to supply the difficiency.

I sometimes wonder if we fully realize the important part our profession takes in the history of the world's progress We know, of course, that every branch of science is indebted to photography and that there is probably no line of industry that does not make use of its products.

This is stale news and I might say unwelcome news for this facility of reproduction cheapens our labor and spreads broadcast the impression that we are manufacturers merely. But we play another part that is so important that your calling should be a matter of pride to you all. The advanced civilization of to-day owes its existence to universal dissemination of knowledge. The day laborer who a few hundred years ago knew no pleasures his appetite or his passions did not suggest, is to-day an intelligent citizen with a knowledge of the possibilities of life and an opportunity to enjoy them. If we were to trace the spread of the growing interest in art in the country during the last few years we would stand appalled at its magnitude. Without photography this would not have been possible, and it is to photographers whose productions enter every home that we must look, largely, for the proper direction of this interest. Success in life does not depend upon the amount of one's bank account. The highest pleasures of life are the pleasures of the mind. Many in their pursuit of wealth have no time for these pleasures, but I congratulate you that in every sense of the word the successful photographer is the cultured photographer.

Dundas Todd, of Chicago, gave an interesting talk, congratulating the members, their achievements, and urging them on to a still higher plain. On motion adjourned.

Tuesday afternoon, Professor Otto Walter Beck, of the Art Museum, of Cincinnati, delivered an illustrated lecture "Criticism on Photography of To-day." Professor Beck has taken a great interest in the possibilities of photography, and his talks are very instructive. He dealt largely with composition, but touched on other points also.

Tuesday evening, a lantern slide exhibition of Celeron Convention pictures was given.

The Nominating Committee reported as follows:

For President, L. A. Dozer, Bucyrus, Ohio.

For First Vice-President, Geo. Edmondson, Cleveland, Ohio.

For Second Vice-President, L. E. Martindale, St. Mary's, Ohio.

For Secretary, W. K. Van De Grift, Lima, Ohio.

For Treasurer, C. L Lewis, Toledo, Ohio.

The above ticket was elected. Each officer acknowledged the compliment in a neat speech.

The next meeting place was taken up. Mr. Goddard, of Lorain, proposed Put-In-Bay. Mr. Minns, of Akron, favored the Great Southern Hotel, Columbus, Ohio.

A general discussion followed and was followed by a ballot. The result of which showed Columbus to have 61 votes, Put-In-Bay 7, and Dayton 1.

A motion was made to appoint a committee to prepare a resolution proposing a change in the annual dues of members of the association. Motion was adopted, and I. Benjamin, Geo. Edmondson, and J. N. Appleton were appointed as committee. Adjourned.

Wednesday afternoon, meeting called to order by President. The Secretary read the following list of awards:

Special class, professional photographers outside of the State.

1st Prize.—Gold Medal, C. M. Hayes & Co., Detroit, Mich.
2d " Silver Medal, J. B. Schriever, Emporium, Pa.
Judges.—R. P. Bellsmith, Geo. M. Edmondson, J. M. Appleton.

Special Amateur Class.—

1st Prize.—Gold Medal, Clarence H. White, Newark, Ohio.
2d " Silver Medal, Kate L. Mathew, Pewee Valley, Ky.
3d " Bronze Medal, E. L. Wehrley, Newark, Ohio.

The following classes for residents of Ohio only.

Grand Prize.—Diamond Badge, B. A. Brigden, Cleveland, Ohio.
Class A.—1. Gold Medal, T. C Osborne, Wooster.
" 2. Silver Medal, C S. Bateham, Norwalk.
" 3. Bronze Medal, C. H. Lewis, Toledo.
Class B.—1. Silver Medal, R. D. Beem, Greenville.
" 2. Bronze Medal, F. G. Goddard, Lorain.
Class C.—1. Silver Medal, Clara Paeszler, Ada.
" 2. Bronze Medal, H. A. Mowery, Ashland.
Class D.—1. Silver Medal, J. H. Burkholder, Mansfield.
" 1. For Photographic Effect.
" 2. Bronze Medal, F. H. Auld, Columbus. Mr. Auld's exhibit was first in pictorial effects.
Class E.—1. Silver Medal, L. C. Overpeck, Hamilton.

Special mention. Remarkably fine specimens. X-ray Photographs, Dr. L. M. Early, of Columbus, Ohio Special mention of excellence of exhibits of I. Benjamin, Cincinnati; J. M. Appleton, Dayton; Dozer & McClain, Bucyrus; D. D. Spellman, Springfield; Edmondson & Decker, Cleveland, and J. R. Wickersham, Urbana, Ohio, none of which were in competition. Judges—C. M Hayes, Detroit, Mich.; J. Will Kellum, Hazleton, Pa; C. R. Reeves, Anderson, Ind.; F. R. Barrows, Fort Wayne, Ind; Geo. Halloway, Terra Haute, Ind.

A paper by D. Backrack on "Printing Methods" was next read, and was listened to attentively.

The committee appointed to amend by-laws as to annual dues reported it advisable to leave membership fee as at present, $2.00. Annual dues for proprietors and employers of help, $2.00 per year. Employees, $1.00.

Wednesday night was given over to social entertainment

The exhibition of photographs in Convention Hall was one of the largest ever shown in the history of the association, there being 76 exhibits in competition, and a number which were shown as complimentary exhibits. The quality of the work shown was also above the average.

The Ohio Salon was, as usual, the principal attraction. Thirty-three pictures were hung in this collection from the numerous exhibits shown.

The Ohio association have reason to be proud of their Salon, and there is a movement on foot whereby the Salon will have a permanent home where pictures can be hung as rapidly as they are selected for this purpose.

The association feel grateful to Messrs. Hollinger & Rockey, of New York, for a half dozen beautiful examples of their portraiture, also to the large number of professional photographers outside of the state who exhibited in the special class. There being some twenty-five exhibits in this class representing the leaders of the profession, the amateurs were also well represented. A large number of beautiful pictures were shown in this division by amateurs from all over the country. The pictorial values in some of the exhibits being grand. The trade was also represented in good numbers. All seemed well pleased with the convention and reported numerous sales. Taken as a whole the convention of 1897 was without a doubt, one of the best and most profitable ever held in the state, and those attending, almost to a man, are loud in their praises of the management and success of the affair.

PHOTOGRAPHIC PATENTS.

GRANTED DURING THE MONTH OF AUGUST, 1897.

(Furnished for the Photographic Times by William S. Hodges, Patent Lawyer, Washington, D. C.)

587,516. **Kinetographic Camera.** A. Wrench, London, England.

A locking wheel is connected to an intermittently operated feed-wheel, said locking wheel being provided with a series of ratchet-teeth and a notch adjacent each tooth. A single locking pawl is provided with a portion adapted to engage said ratchet-teeth and a tooth for engaging said notches, whereby the pawl will lock the feed-wheel against movement in both directions. Means are provided for disengaging said pawl.

587,527. **Kinematographic Lantern or Apparatus.** J. W. Holst, Amsterdam, Netherlands.

A kinematographic lantern is provided with an endless carrier which is supported by a pair of rotary devices, the portions of said carrier between the supporting devices being maintained in a straight line. A series of lenses are carried by said carrier and means are provided for supporting a film in line with the path of said lenses and intermediate of said supporting devices. An illuminating device is located in the rear of said film and means are provided for moving said film and carrier uniformly at the same speed and in the same direction.

587,729. **Kinetographic Camera.** L. Grubman, New York, N. Y.

In a series photographic device the inventor provides an intermittently operated feed-wheel and means for engaging the film therewith both before and after exposure.

587,991. **Photographic Plate Holder.** A. Mutschler and J. A. Robertson, Rochester, N. Y.

A sheet-metal front is provided with an exposing aperture and projecting shoulders around three sides forming a slide recess between the front and a rib along the other side. The plate recess is stamped in the back section and is provided with outwardly projecting rounded corners, a partition being extended across said recess. The exposing slide and light-excluding shutter, are located between the partition and the side of the recess.

588,014. **Kinetographic Camera.** J. Rous, Paris, France.

A chronophotographic apparatus is provided with wheels adapted to draw along a continuous film, said wheels being mounted on a suitable shaft. A notched wheel is also mounted on said shaft, and is engaged by an elbow lever which is operated by a cam upon a rotary spindle. Said spindle is also provided with a projection adapted to engage said notched wheel, whereby the rotary motion of said spindle imparts an intermittent motion to said wheel.

588.597. **Photographic Background Carrier.** L. C. Overpeck, Hamilton, Ohio.

A movably connected series of parallel rolls is mounted in a suitable framework, said rolls being capable of being unwound at any point and arranged to be brought selectively into position for use. Each roll is provided with a retarding agent. A winding crank is mounted on the frame and a winding spindle connected therewith and adapted to be engaged selectively with said rolls.

588,611. **Roll-Holding Camera.** P. K. Stern, St. Louis, Mo., assignor to the Stern Manufacturing Co., same place.

A photographic camera is provided with an exposure chamber composed of collapsible walls and hinged rigid walls, a lens being situated at one extremity of said chamber. A receptacle for sensitized material is located in the opposite extremity of said chamber, and a rigid wall is located adjacent said receptacle and hinged thereto, the chamber being adapted to collapse upon the angular approach of said receptacle and rigid wall.

588,790. **Method of and apparatus for packing photographic films.** T. H. Blair, Northborough, Mass., and S. E. Waterman, Pawtucket, R. I., assignors by mesne assignments to the American Camera Manufacturing Co., Northborough, Mass.

This improved process consists in feeding the composition which forms the base of the film onto a moving surface which draws it into a thin strip, carrying the strip over suitably constructed and arranged guides while it becomes seasoned, conducting the strip into a dark room and passing it through a sensitive emulsion.

588,916 **Kinetoscope.** W. G. Steward and E. F. Frost, Washington, D. C.

The inventors claim the method of directing light rays consisting in causing the rays of light from a series of moving objects, each to be held stationary through a given point.

589,055. **Stereoscope.** H. C. White, North Bennington, Vt.

A shaft having a broadened end is attached to a lens frame, and a hood, which is also fastened to the latter, forms a dark chamber before the eyes, said shaft and hood being formed with beveled edges which fit together without overlapping, the hood being substantially flush on the underside with the end of the shaft.

589,168. **Kinetographic Camera.** T. A. Edison, Llewellyn Park, N. J.

This invention is described by the inventor as being an apparatus for effecting by photography a representation suitable for reproduction of a scene including a moving object or objects, and comprises means for intermittently projecting at such rapid rate as to result in persistence of vision images of successive positions of the object or objects in motion, as observed from a fixed and single point of view, a sensitized tape-like film, and means for so moving the film as to cause the successive images to be received thereon separately and in a single line sequence.

589,260. **Embossing Photographs.** D. F. Hulbert, St. Louis, Mo., assignor to the Hulbert Bas Relief Co., the same.

This is an apparatus or die for embossing photographs and comprises an embossing die or form consisting of a malleable metal plate having a picture or design upon one of its sides, said plate being embossed to form a pattern. Said pattern is outlined or indicated by said picture or design, and said plate is backed by a mass of hardened plastic material. An embossing die or form consisting of a malleable metal plate is adapted to be pressed firmly against the first mentioned malleable metal plate and backed by a mass of hardened plastic material.

Over-developed negatives may, according to Herr Jandaurek, be restored as follows:—A stock solution is made of 10 grammes of sulphate of copper (blue vitriol) and 30 grammes of common salt in 120 c.c. distilled water. To every part of the stock solution add ten parts of water. Lay the washed negative in this diluted solution, gently rocking it for several minutes, until both by looking down upon it and looking through it its surface appears to be covered with a dense white precipitate. Take out the negative, rinse it well with water, and then lay it in a diluted solution of liquid ammonia, about 6 to 10 of water to one part of ammonia, until the negative is sufficiently reduced. The rapidity of the reduction depends upon the strength of the ammonia, which should always be added fresh.

OVER-EXPOSURE.—A term applied if the exposure of the sensitive surface be prolonged farther than is required to impress it with all the detail, even in the darkest parts. The effect produced is seen in the developing when the image rapidly makes its appearance, and before sufficient density can be obtained it appears fogged. The resulting negative is exceedingly thin, generally full of detail, but wanting in contrast and brilliancy. By very careful manipulation in development the effects of over-exposure can be partly corrected.

If the plate is known to be over-exposed it can sometimes be saved by immersing for two or three minutes in diluted chlorine water before developing.

Considerable over-exposure produces solarization and reversal of the image (*q.v.*)

OXALATE-DEVELOPER.—See **Developer.**

OXALATE OF AMMONIUM.—See **Ammonium Oxalate.**

OXALATE OF IRON.—See **Ferrous Oxalate.**

OXALATE OF POTASH.—See **Potassium Oxalate.**

OXALATES; TESTS FOR.—Solutions containing these salts give—with barium nitrate a white precipitate soluble in hydrochloric acid and with silver nitrate a white precipitate soluble in nitric acid.

OXALIC ACID (Formula, $H_2 C_2 O_4 + 2H_2 O$; molecular weight, 126).—A white crystalline body frequently found in plants, and which may be produced by the oxidation of sugar and other organic substances, or by acting on starch, sugar, or cellulose with nitric acid, or fusion with caustic alkali.

It is produced commercially by fusing sawdust with a mixture of soda and potash at a temperature of 204° C., decomposing the oxalate with lime, and the lime salt with sulphuric acid, and afterwards recrystallizing. It takes the form of colorless transparent prisms soluble in eight parts of water at 15° C, and in its own weight of boiling water. It forms a powerfully acid solution. It unites with bases, forming neutral and acid salts, and is highly poisonous. Half an ounce is known to have been fatal.

Oxalic acid sometimes contains traces of sulphuric acid. This may be detected by the addition of barium nitrate, and afterwards hydrochloric acid in excess. If sulphuric acid be present a portion of the precipitate will remain undissolved. It is employed in the preparation of ferric oxalate.

OXALIC ETHER (Formula, $C_2 O_4 (C_2 H_5)_2$).—Neutral oxalate of ethyl prepared by the distillation of a mixture of four parts binoxalate of potash, five parts oil of vitriol, and four parts of strong alcohol. The distillate is then washed in water. It forms a colorless oily liquid, with an agreeable aromatic odor, and a specific gravity of 1·09. It is only slightly soluble in water.

OXFORD MOUNT.—See **Mount.**

OXGALL (also known as *oxbile*). The fresh bile of the ox purified and evaporated to the necessary consistency. It is used in painting with water colors, and is especially serviceable in causing the colors to adhere to the surface of albumen paper photographs. It is soluble in water and methylated spirit. The surface of the print should be rubbed over with a small quantity of an oxgall solution previous to applying the colors.

OXIDATION.—The chemical change which causes the formation of oxides, and which is brought about by the action of oxygen acids, water, or free oxygen. Refer to developer and method of keeping.

OXIDE.—The product of the combination of oxygen, with a metal or metalloid. When substances are burnt, they are not lost, but have simply changed into new bodies by combination with the oxygen of the air. If it be a metal the product is an "oxide" or "base" which, if soluble in water, has properties the reverse of acid.

OXIDE OF CALCIUM.—See **Calcium Oxide.**

OXIDE OF COPPER.—See **Copper Oxide.**

OXIDE OF MANGANESE.—See **Manganese Binoxide.**

OXIDE OF SILVER.—See **Silver Oxide.**

OXYACID.—Acids which contain oxygen, such as sulphuric acid, which has for its formula H_2SO_4.

OXYAMMONIUM CHLORIDE.—See **Hydroxylamine Hydrochloride.**

OXYCALCIUM LIGHT.—See **Oxyhydrogen Light.**

OXYETHER.—A mixture of oxygen and ether. This is used in a form of oxyhydrogen light for the lantern.

OXYGEN (Symbol, O; atomic weight, 16).—The most abundant element. It is present in the air we breathe, it forms $\frac{8}{9}$ths (by weight) of water, and is present, to a great extent, in the solid part of the earth.

Oxygen can only be obtained from something that contains it. For this purpose chlorate of potassium is the most convenient, as by merely applying heat it separates into potassium chloride and oxygen, thus—

$$KClO_3 = KCl + 3O$$

One molecule of the salt yielding three atoms of oxygen gas.

In the preparation of oxygen for commercial purposes, the potassium chlorate with about half its weight of black oxide of manganese is used.

In the following description* will be found a simple method of manufacturing oxygen gas on a small scale:

Oxygen gas is obtained by subjecting to heat in a copper retort a mixture of one part of black oxide of manganese with four parts of chlorate of potash. The exact proportions are not arbitrary. The gas comes from the chlorate, and the office of the manganese is only to separate the particles of chlorate, that the gas may generate evenly and be more readily controlled.

A pound of chlorate should yield about $4\frac{1}{2}$ cubic feet of gas.

A test of the chemical should be made before using. This may be done by putting a little in an iron dish or spoon and holding over a lamp. If the chemicals are good they will melt, dry up and leave a gray residuum, but if not good they will flash up, in which case they would not be safe to use.

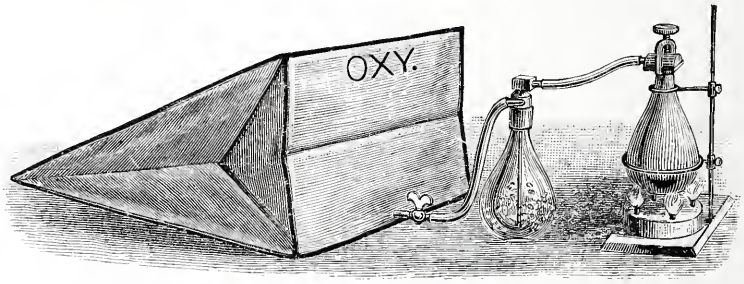


FIG. 326. RUBBER GAS BAG. WASH BOTTLE. COPPER RETORT, STAND & LAMP.

The copper retort must be clean and dry. Put into it sixteen (16) or eighteen (18) ounces chlorate of potash and about one-quarter as much black oxide of manganese first thoroughly mixed. Close the retort tightly and attach the rubber hose to the pipe on top of retort. The other end of the rubber hose goes on the nozzle connecting the tube running inside one of the purifying bottles. From the other nozzle of the bottle another piece of rubber hose connects the bottle with the gas bag.

The purifying bottle must contain water enough to cover about an inch of the lower end of the brass tube. The gas passes from the retort through the rubber hose and the brass tube into the water, which washes it as it passes through; it is then carried by its own force out at the other nozzle into the bag. Before making all the connections, blow through the tubes to see if they are clear.

After connecting retort and wash bottle place the lighted lamp under the retort, turning the light well up. In a few minutes the water in the bottle will bubble as the gas generates. Allow it to escape for a while. Test its strength by holding before the open orifice a piece of charred wood with remaining sparks of fire; when strong enough to fan these into a flame, the rubber hose connecting with the gas bags may be attached and the gas allowed to flow into the bag. Be sure the cock on the gas bag is opened to allow the gas to enter.

Very violent agitation in the bottle should be checked by removal of heat from retort.

Action will go on some time after lamp is removed and perhaps long enough to fill the bag, but should it not, heat must again be applied to retort. A little care in regulating heat of retort will insure a regular flow of gas until the bag is full.

When the bag is full, disconnect rubber hose from bottle, close stop cock on the bag, disconnect bottle from retort and then remove the heat.

---

* This description is supplied by Messrs. J. B. Colt & Co., 16 Beekman Street, N, Y., who manufacture the apparatus depicted.

Cleanse the retort by a thorough washing with water until all black sediment is removed and then put it where it will dry completely, as there must be no moisture in it when gas is made.

Blow through pipes and hose and see that they are free from obstructions.

The apparatus used for the generation of one of the gases should never be used for the other, therefore it will be well to mark plainly the bag, bottle and connections with the name of gas for which they are first used.

The action of the manganese is not properly understood, but the evolution of the oxygen is rendered considerably more rapid even with a much lower temperature. Clean, coarse sand is equally efficacious.

The preparation of oxygen on a large scale by the Brin method is thus described:* The routine of the process begins with the pumping in of air from the atmosphere, which is passed into a large receiver containing caustic lime, and thence into a second and smaller receiver of caustic soda; the latter acting as a check on the former in the removal of moisture and carbonic acid from the air. The purified air is then passed into large pumps, where it undergoes slight compression, and finally passes through a chamber for filtering out solid particles, and a distributor placed on top of the furnace, into the retorts. The large furnaces are built at an angle with the horizontal, and contain on each side twelve inclined retorts, of cast iron, of six and a half inches internal diameter, one inch thick and about ten feet long. These hold between 2000 and 3000 pounds of barium in small lumps. A temperature of about 1300° Fahr. is obtained by the admission of primary and secondary air into a coke furnace, the carbonic oxide found being burnt into carbonic acid in the combustion chambers. By means of wall-holes in the sides of the furnaces one sees the retorts at a dull red heat. The heated barium abstracts the oxygen from the purified air, and the free nitrogen escapes up through an automatic valve, whence it passes out into the atmosphere. At the end of five minutes an automatic reversing gear reverses the working, a vacuum is created in the retorts, the air and impure oxygen in the connecting pipes are blown away, and the oxygen passes back through the pipes to a comparatively distant part of the works into the gasholder, which has a capacity of 2000 feet.

In another five minutes the reversing gear is again automatically converted, air passes into the purifiers, as before, thence to the pumps and retorts, and so on, for every five minutes of the day and night, Sundays as well as week days, all the year round. The maximum volume of gas capable of being drawn off can thus be seen to be very large. At the time of our visit only one of the furnaces and one set of retorts were at work. As showing the longevity of the barium oxide, the company are still using barium which was first employed in 1886, when the Brin syndicate started working the process. After a time the barium is prone to cohesion, when it has to be taken out and broken up.

From the moment when the air is pumped into the purifiers until the pure oxygen leaves the compressor the process is practically automatic, save and except such attention as even automatic machinery must have. Of special value in this, in that, when the air and impure oxygen are blown out of the pipes, the egress of atmospheric air is prevented. In atmospheric air there are, by weight 23.1 parts of oxygen to 76.9 of nitrogen, and by the Brin process about fifteen parts by weight of the oxygen are taken up by the barium monoxide.

OXYGENATE.—To unite or combine with oxygen.

OXYGENATED WATER.—See **Hydrogen Peroxide.**

OXYGENOUS.—Pertaining to or derived from oxygen.

OXYHYDROGEN.—A mixture of oxygen and hydrogen used in the limelight for the optical lantern.

OXYMEL PROCESS.—An early process for keeping the collodion moist. Oxymel is a mixture of vinegar and honey, and collodion plates coated over with it were found to retain their good qualities several hours. The exposure was, however, considerably increased.

OXYPHENIC ACID.—See **Pyrocatechin.**

OZONE.—This is usually considered to be oxygen in an allotropic condition. It is nearly always present in the air, apparently as the result of electrical action. It can be produced by passing electric sparks into dry air, and also by placing sticks of clean phosphorus in a bottle of oxygen, and half covering them with water. It possesses a peculiar slightly metallic odor, and appears to possess all the properties of oxygen in an enhanced degree. It liberates iodine from potassium iodide. Schönbein, who discovered and named it, employed this re-action for detecting it in the atmosphere.

PACKFONG (Chinese).—A Chinese alloy known as white copper. It is composed of copper 40·4, zinc 25·4, and nickel 31·6. It is used sometimes for making mirrors or reflectors.

---

*The Lantern Record.

PACKING PLATES.—In packing sensitive dry plates every precaution must be taken in protecting them from the light and from mechanical injury and chemical change. Very many methods are employed; probably the use of grooved boxes or strips of cardboard folded so as to prevent the sensitive surfaces of the plates from touching, are the methods most generally adopted. A good plan is to take a long strip of perfectly pure tissue paper, and so fold it that it lies between every plate. By thus alternating the plates and paper the fear of breakage is reduced to *nil*. It is, however, absolutely essential that the paper be chemically pure. Gelatino-bromide films rapidly absorb impurities from materials in which they are wrapped, a chemical change is produced, and on developing a black mark is visible usually round the edges of the plate. The more rapid the dry plate the more sensitive it is to these changes.

When travelling aboad it is very difficult sometimes to restrain Custom House officials from opening and examining packages of dry plates, more especially if the tourist's knowledge of the language of the country is imperfect. In order to prevent this, therefore, the following labels have been compiled, and will be found to fairly cover the ground.

English.—Photographic dry plates, sensitive to light. Open only in a dark-room or by a red light.

French.—Plaques séches photographiques. A ouvrir seulement avec eclairage couleur rubis. *Or*—Plaques photographiques sensibles. Tout detruites par l'exposition à la lumière. Prendre garde de n'ouvrir la boîte que dans une chambre parfaitement obscure.

German.—Photographische trockenplatten. Sehr lichtempfindlich. Werden ganz verdorben, wenn dem Lichte ausgesetzt. Müssen nur in absolut dunkelm Zimmer oder bei rothem Lichte geöffnet werden.

Italian.—Teme la luce. Lustre da seccare fotografiche. Da aprire solamente con illuminazione colore de rubino.

Spanish.—Las planchas fotográficas sensibles se inutilizan si se las expone al abrirlas, á la luz del dia, se pueden abrir sin peligro en una habitación enteramente oscura ó iluminada por luz roja.

Swedish.—Fotografiska plätar ma icke oppenas utom vid rodt Ljus. *Or*—Ljuskäushga fotografiska plätar, blivfa förstörda om de uttsätas för ljus. Fas derföre ej öppnas utom i ett absolut mörkt rum.

Norwegian.—Fotografiske plader maa ikke aabnes udem ved rodt Lys.

Portuguese.—Nao podem ser expostas á luz porque se enutilisam; podendo só ser abertas em camara, ou com.

PAD.—A soft piece of felt or other material used to place between the sensitive paper lying on the negative and the back of the printing frame to prevent breakage of the negative, and to ensure even and uniform contact between the sensitized paper and the negative film.

PAINTING PHOTOGRAPHS.—Photographs may be painted over either with oil or water colors. With the latter the silver print should be previously washed over with a solution of oxgall. The colors will then adhere more firmly. See **Colored Photographs, Oil Paintings,** &c.

PALLADIUM. (Symbol Pd; atomic weight, 105·7).—A tetrad metallic element usually found associated with gold and platinum, chiefly in South America. It is separated from the gold by fusing the alloy with silver* and boiling it with nitric acid, which leaves the gold undissolved. The silver is precipitated from the solution as chloride by adding sodium chloride, and metallic zinc is placed in the liquid which precipitates the palladium, lead, and copper as a black powder. This is dissolved in nitric acid, and the solution mixed with an excess of ammonia, which precipitates the lead oxide, leaving the copper and palladium in solution. On adding hydrochloric acid in slight excess a yellow precipitate of palladamine hydrochlorate is obtained, which when heated leaves metallic palladium.

Palladium has a sp. gr. of 11·5. It resembles platinum in malleability and ductility, but is more fusible, less dense, and has a more silvery appearance. The chloride has occasionally been recommended for toning.

PALLADIUM TONING.—Palladous chloride is used for this purpose. It may be obtained in crystals or in solution; the bath is made up of

Palladous chloride	1 grain.
Sodium sulphite	20 grains.
Water	10 ounces.

A silver print is first made upon plain salted paper. This is washed with clear water containing a little common salt, and afterwards in pure water. The print is then brushed over with the palladium solution as above. Some operators recommend that the solution be made slightly acid by the addition of a few drops of nitric acid. The picture is then fixed in hypo containing a few drops of ammonia added until the solution smells slightly of it. Each lot of prints should be fixed in a fresh bath. The results obtained are very similar to those toned with platinum. For rough surface paper the black tone is very effective, the prints much resembling Indian ink drawings. Palladous chloride is very expensive, but the quantity used is small.

---

* Bloxham's Chemistry.

Another formula* is as follows :

Palladous chloride	1 gramme.
Chloride of sodium	1 gramme.
Distilled water	100 c. c.

If any difficulty is occasioned in solution or if a precipitate be formed, the liquid is slightly heated in a porcelain dish until the solution becomes clear. 10 c. c. of acetic acid and 400 c. c. of distilled water are then added. In toning a yellow tinge will sometimes appear in the prints, this can be removed by immersion in a 5 per cent. solution of ammonia.

PALLADOUS CHLORIDE (Formula, $PdCl^2$).—Prepared by acting on palladium with aqua regia and evaporating. The brown hydrated crystals obtained, if heated to redness, lose chlorine, leaving metallic palladium. In this respect it much resembles platinum as well as in the formation of double salts with the alkaline metals. It is used in the palladium toning process.

PANEL.—The style of a professional photograph, usually about 4 x 8½ inches.

PANEL LENS.—A lens constructed for making panel photographs. It has usually a diameter of about 3¼ to 4 inches, and a focal length of between 16 and 20 inches, the sitter being placed at from 14 to 16 feet from it.

PANORAMIC CAMERA. — A camera specially constructed as to enable photographs embodying a very large angle of view to be taken, usually upon a curved surface. The first camera of this kind was constructed by Mr. Martens, of Paris, in the year 1847, for cylindrical Daguerreotype plates. Then followed the camera of Sutton.† A cylindrical glass was employed, and the negative paper bent so as to press against it. Cylindrical collodion plates were also used, but this, of course, necessitated the use of curved printing frames. These plates were, of course, curved in the form corresponding to the rotation of the camera around the axis situated exactly below the center of the lens. If flat plates had been used it will be obvious that the upper horizontal lines of the image would be curved in an upward direction, and the lower ones in a downward. After Sutton's patent came the improvement of Dr. Liesegang, by which it was transformed into a simple rotating camera. A stout tripod carries a large polished table, fitted to which is a pivot or axis upon which the camera turns. The pivot is so adjusted as to fall into the same plane as the optical center of the lens. These cameras are made in two sizes for plates 19 by 9 and 23 by 11 inches. In front of the plate inside the camera a flexible band is fitted which has a narrow vertical slit through which only the middle rays of light pass. This slit is about a quarter of an inch wide, but widened out a little where the near foreground falls in order to secure a longer exposure for that portion of the picture, and thus impart greater uniformity to the tone of the negative. The two motions of the instrument, viz, that of the camera on its axis and the motion of the dark slide, supported on wheels, from right to left, are performed by an ingenious arrangement of horizontal cords and pulleys. After focusing, the operator has only to turn a handle to take in the wide scope of the horizon or a group arranged in a semicircle around the instrument. Any lens may be used provided its focus is in a range with the length of the camera.

The latest form of panoramic camera is that shown in Fig. 327. Films are used, and these are placed in the curved holder. The light from the lens passes through a small slit, which runs along the sensitive film as the lens rotates. See also **Panoramic Photography, Cylindrograph.**

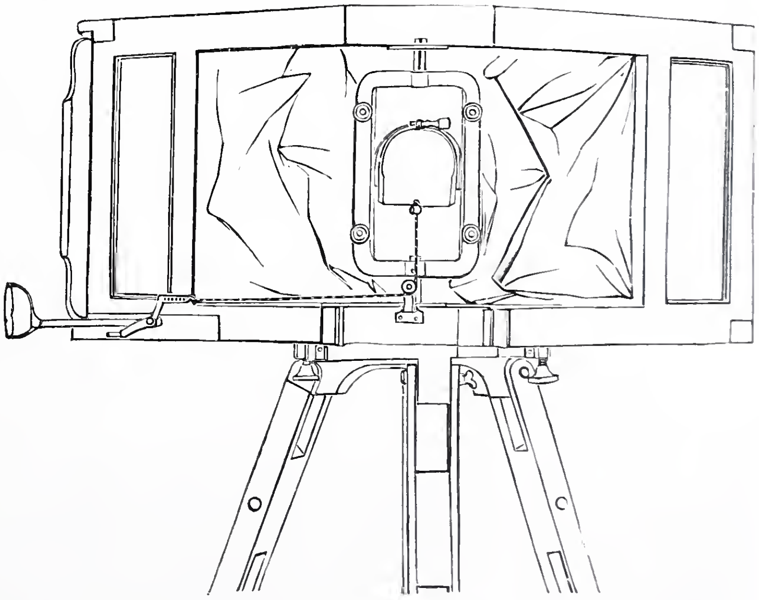


FIG. 327.

PANORAMIC LENS.—A lens constructed for making panoramic views. The first of this kind was invented and patented by Sutton in 1858. It was intended for photographing views, including an angle of 90 degrees or more upon spherical bowls or cylindrical glasses. See **Fluid Lens.**

---

* P. C. Duchochois.

† See Sutton's "Dictionary of Photography."

PANORAMIC PHOTOGRAPHY.—In making panoramic views a panoramic camera is usually employed. This is described under that heading. Panoramic views may also be made with an ordinary camera by taking two or three views and joining them together. For this purpose the screw of the tripod must be slightly loosened, so that the camera turns round easily. When the first view is made, objects on the extreme right hand side of the glass are noted, and the camera turned round on the screw until these objects appear on the extreme left. The second view is then made, and so on. In mounting the prints from the different negatives the greatest care must be taken to make the joints neatly, and to have the prints cut so that the images join together properly. When any difficulty is experienced in this it will be found a better plan to mount the pictures about a quarter to half an inch apart. This method is not quite so effective, but appears considerably better than a badly joined view.

It will be obvious that with all panoramic views the laws of perspective are violated to a considerable extent, and that an absolutely correct representation of the view is not given. Burton* in an article upon this subject gives a diagram (see Fig. 328), showing how the pictures must be arranged to be viewed correctly. In this it is supposed that five 12x10 pictures taken with 22 inch lens are cut down to 11 inches in length. In Sutton's camera curved plates were used, and prints made from these curved negatives were viewed flat. To obtain correct representation it would be necessary to view them curved in the same manner.

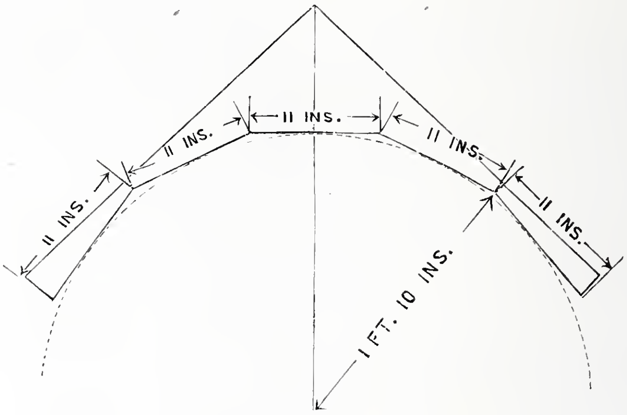


FIG. 328.

PANTASCOPIC CAMERA.—An instrument invented by J R. Johnson for taking panoramic views, including an angular extent up to 360 degrees upon a flat plate with a common lens by means of mechanism or clockwork.

PAPER.—A material made in thin sheets from a pulp of rag esparto grass, straw, wood, and many other fibres. Over 500 different substances have been used for manufacture of paper; rags and esparto grass form the best materials, however.

A large number of different kinds of paper are now manufactured in this country. For most photographic purposes it is advisable to use perfectly pure paper. The best known are those manufactured at Rives and at Saxe; these papers have a very even body, and are quite free from chemical impurities.

Metal dust in paper will not be visible until the same be sensitized with silver nitrate when black spots will directly appear.

The quality of the paper has also a considerable effect upon the subsequent permanency of the photographic images made upon it. Many kinds contain a large quantity of sodium hyposulphite used as an antichlor. This should be carefully tested for.

The following tables of sizes of the different printing and writing papers will be found of use :—*

PRINTING PAPERS.

DESCRIPTION.	BROADSIDE.	LONG FOLIO.	LONG THIRDS.	LONG FOURTHS.	BROAD FOLIO.	BROAD THIRDS.
Double Super Royal	41 x 27½	41 x 13¾	41 x 9⅙	41 x 6⅞	27½ x 20½	27½ x 13⅔
Do. Royal	40 x 25	40 x 12½	40 x 8⅓	40 x 6¼	25 x 20	25 x 13⅓
Do. Demy	35 x 22½	35 x 11¼	35 x 7½	35 x 5⅝	22½ x 17½	22½ x 11⅔
Imperial	30 x 22	30 x 11	80 x 7⅓	30 x 5½	22 x 15	22 x 10
Double Crown	30 x 20	30 x 10	30 x 6⅔	30 x 5	20 x 15	20 x 10
Super Royal	28½ x 21½	28½ x 10¾	28½ x 7⅙	28½ x 5⅜	21½ x 14¼	21½ x 9½
Double Foolscap	27 x 17	27 x 8½	27 x 5⅔	27 x 4¼	17 x 13½	17 x 9
Royal	25 x 20	25 x 10	25 x 6⅔	25 x 5	20 x 12½	20 x 8⅓
Medium	24 x 19	24 x 9½	24 x 6⅓	24 x 4¾	19 x 12	19 x 8
Demy	22¼ x 18	22¼ x 9	22¼ x 6	22¼ x 4¼	18 x 11⅛	18 x $7\frac{5}{12}$
Crown	20 x 15	20 x 7½	20 x 5	20 x 3¾	15 x 10	15 x 6⅔
Foolscap	17 x 13½	17 x 6¾	17 x 4½	17 x 3⅜	13½ x 8½	13½ x 5⅔

---

* PHOTOGRAPHIC TIMES, February 24, 1893.

WRITING PAPERS.

DESCRIPTION.	BROADSIDE.	LONG FOLIO.	LONG THIRDS.	LONG FOURTHS.	BROAD FOLIO.	BROAD THIRDS.
Imperial.	30 x 22	30 x 11	30 x 7⅓	30 x 5½	22 x 15	22 x 10
Su. Royal H. M. B. L.	27 x 19¼	27 x 9⅝	27 x 6 5/12	27 x 4 13/16	19¼ x 13½	19¼ x 9
Royal H. M. B. L	24¼ x 19½	24¼ x 9¾	24¼ x 6½	24¼ x 4⅞	19½ x 12⅛	19½ x 8 1/12
Do. H. M.	24 x 19½	24 x 9¾	24 x 6½	24 x 4⅞	19½ x 12	19½ x 8
Medium H. M. B. L	22 x 17¼	22 x 8⅝	22 x 5¾	22 x 4 5/16	17¼ x 11	17¼ x 7⅓
Do. M. M. B. L.	22½ x 17¾	22½ x 8⅞	22½ x 5 11/12	22½ x 4 7/16	17¾ x 11¼	17¾ x 7½
Demy H. M. B. L	20 x 15¾	20 x 7⅞	20 x 5¼	20 x 3 15/16	15¾ x 10	15¾ x 6⅔
Do. M. M. B L	20¼ x 15½	20¼ x 7¾	20¼ x 5⅙	20¼ x 3 13/16	15½ x 10⅛	15½ x 6¾
D'ble Foolscap M. M	27 x 17	27 x 8½	27 x 5⅔	27 x 4¼	17 x 13½	17 x 9
Foolscap H. M. B. L.	17 x 13½	17 x 6¾	17 x 4½	17 x 3⅜	13½ x 8½	13½ x 5⅔
Do. M. M.	16½ x 13¼	16½ x 6⅝	16½ x 4 5/12	16½ x 3 5/16	13¼ x 8¼	13¼ x 5½

PRINTING PAPERS.

LONG QUARTO.	BROAD QUARTO.	LONG OCTAVO.	COMMON OCTAVO.	LONG 12MO.	COMMON 12MO.	16MO.	32MO.
27½ x 10¼	20½ x 13¾	20½ x 6⅞	13¾ x 10¼	13¾ x 6⅚	13⅔ x 6⅞	10¼ x 6⅞	6⅞ x 5⅛
25 x 10	20 x 12½	10 x 6¼	12½ x 10	12½ x 6⅔	13⅓ x 6¼	10 x 6¼	6¼ x 5
22½ x 8¾	17½ x 11¼	17½ x 5⅝	11¼ x 8¾	11¼ x 5⅚	11⅔ x 5⅝	8¾ x 5⅝	5⅝ x 4⅜
22 x 7 1/1	15 x 11	15 x 5½	11 x 7⅛	11 x 5	10 x 5½	7½ x 5½	5½ x 3¾
20 x 7½	15 x 10	15 x 5	10 x 7⅓	10 x 5	10 x 5	7½ x 5	5 x 3¾
21½ x 7⅛	14¼ x 10¾	14¼ x 5⅜	10¾ x 7⅛	10¾ x 4¾	9½ x 5⅜	7⅛ x 5⅜	5⅜ x 3 9/16
17 x 6¾	13½ x 8½	13½ x 4¼	8½ x 6¾	8½ x 4½	9 x 4¼	6¾ x 4¼	4¼ x 3⅜
20 x 6¼	12½ x 10	12½ x 5	20 x 6¼	10 x 4⅙	8⅓ x 5	6¼ x 5	5 x 3⅛
19 x 6	12 x 9½	12 x 4¾	9½ x 6	9½ x 4	8 x 4¾	6 x 4¾	4¾ x 3
18 x 5 9/16	11⅛ x 9	11⅛ x 4½	9 x 5 9/16	9 x 3 17/24	7 5/12 x 4½	5 9/16 x 4½	4½ x 2 25/32
15 x 5	10 x 7½	10 x 3¾	7½ x 5	7½ x 3⅓	6⅔ x 3¾	5 x 3¾	3¾ x 2½
13½ x 4¼	8½ x 6¾	8½ x 3⅜	6¾ x 4¼	6¾ x 2⅚	5⅔ x 3⅜	4¼ x 3⅜	3⅜ x 2⅛

WRITING PAPERS.

LONG QUARTO.	BROAD QUARTO.	LONG OCTAVO.	COMMON OCTAVO.	LONG 12MO.	COMMON 12MO.	16MO.	32MO.
22 x 7½	15 x 11	15 x 5½	11 x 7½	11 x 5	10 x 5½	7½ x 5½	5½ x 3¾
19¼ x 6¾	13½ x 9⅝	13½ x 4 13/16	9⅝ x 6¾	9⅝ x 4½	9 x 4 13/16	6⅜ x 4 13/16	4 13/16 x 3⅜
19½ x 6 1/16	12⅛ x 9¾	12⅛ x 4⅞	9¾ x 6 1/16	9¾ x 4 1/24	8 1/12 x 4⅞	6 1/16 x 4⅞	4⅞ x 3 1/32
19½ x 6	12 x 9¾	12 x 4⅞	9¾ x 6	9¾ x 4	8 x 4⅞	6 x 4⅞	4⅞ x 3
17¼ x 5½	11 x 8⅝	11 x 4 5/16	8⅝ x 5½	8⅝ x 3⅔	7⅓ x 4 5/16	5½ x 4 5/16	4 5/16 x 2¾
17¾ x 5⅝	11¼ x 8⅞	11¼ x 4 7/16	8⅞ x 5⅝	8⅞ x 3¾	7½ x 4 7/16	5⅝ x 4 7/16	4 7/16 x 2 13/16
15¾ x 5	10 x 7⅞	10 x 3 15/16	7⅞ x 5	7⅞ x 3⅓	6⅔ x 3 15/16	5 x 3 15/16	3 15/16 x 2½
15½ x 5 1/16	10⅛ x 7¾	10⅛ x 3⅞	7¾ x 5 1/16	7¾ x 3⅜	6¾ x 3⅞	5 1/16 x 3⅞	3⅞ x 2 17/32
17 x 6¾	13½ x 8½	13½ x 4¼	8½ x 6¾	8½ x 4½	9 x 4¼	6¾ x 4¼	4¼ x 3⅜
13½ x 4¼	8½ x 6¾	8½ x 4⅜	6¾ x 4¼	6¾ x 2⅚	5⅔ x 3⅜	4¼ x 3⅜	3⅜ x 2⅛
13¼ x 4⅛	8¼ x 6⅝	8¼ x 3 5/16	6⅝ x 4⅛	6⅝ x 2¾	5½ x 3 5/16	4⅛ x 3 5/16	3 5/16 x 2 1/16

The various photographically prepared papers will be found under their respective headings.

PAPER, ALBUMENIZED.—See Albumenized Paper.

PAPER, BARYTA.—Paper coated with Baryta chalk and gelatine with a little tinting matter added. It is used for coating with gelatino-chloride emulsion, as the chalk substratum keeps the gelatine film on the surface of the paper. It is chiefly used, however, for making high-class prints by the Collotype process.

PAPER, BLOTTING,—A thick, bibulous, unsized paper, much used in photography for absorbing superfluous moisture from prints, plates, etc. It is essential that for many purposes a chemically pure kind be used. This is best obtained from a good dealer in photographic materials. Ordinary blotting paper usually contains a large quantity of hypo used as an antichlor.

After silver prints are washed they are usually placed between sheets or boards of blotting paper to dry. The paper should not be used too often, as it eventually becomes impregnated with fixing salt, which is likely to be very detrimental to the subsequent permanency of the pictures.

PAPER CLIP.—A clasp for holding and hanging up paper. They are made of metal, wood and glass.

---

* These tables were drawn up under the direction of Colonel H. R. Thuellier, R.E., by Colonel J. Waterhouse, assisted by others, for the Survey of India Department.

PAPER, FILTERING.—See **Filtering Paper.**

PAPER, MATT.—A paper having a matt or dead surface. When salted and sensitized it gives very artistic prints. See **Matt-surface Paper.**

PAPER NEGATIVE—A negative made upon a paper support in the place of the glass-plate usually used. The advantages of paper over glass are at once apparent. For tourists the reduction in the weight is naturally a great advantage; and further, it is more easily stowed away—a hundred negatives can be placed away in a single book. It is usually used in a roll-holder or roller slide (*q.v.*), the various exposures being made on a long band of the sensitized paper. The emulsion used for preparing the paper is similar to that employed in the manufacture of dry-plates. The drawbacks to the use of paper instead of glass as a support are, first, its opacity in requiring longer time to print the positives*; secondly, the reproduction of the grain of the paper in the positive.

PAPER, NON-ACTINIC.—See **Non-actinic Medium.**

PAPER, OILED.—Prepared by brushing sheets of paper over with boiled oil, and suspending them till dry.

PAPER, SENSITIZED.—See **Sensitized Paper.**

PAPER SIZE.—Writing papers are usually sized with gelatine prepared from tanners' and parchment makers' clippings. Plate paper that is intended to receive impressions in colors is sized with a clear solution of isinglass. For printing papers a compound of alum and resin dissolved in a solution of soda, and combined with potato starch, is usually used. This is mixed with the paper pulp. Starch is also used either as a paste or as a clear solution.

PAPIER MACHE.—A material composed chiefly of paper. The common varieties are prepared by pulping any kind of mixture of different kinds of paper into a homogeneous mass of a doughy consistence. The pulp is rolled into thick sheets, and afterwards pressed in a mould to the shape required. The surface then can be painted with oil or size colors, or varnished. It is used in photography for making dishes or baths. For this purpose it is very useful, owing to its lightness and toughness.

PAPYROTINT PROCESS.—A photo-lithographic process invented by Husband. It is a modification of Captain Abney's improved method of papyrotype. It is specially suitable for the reproduction of subjects in half-tone. The advantage it possesses over other methods are that a transfer can be taken in greasy ink, for transfer to stone or zinc, direct from the negative, the requisite grain being simply obtained by a chemical change. The method is as follows:—Any good surface paper is first floated on a bath of

Gelatine (Nelson's Flake)	8 ounces
Glycerine	1½ ounces
Sodium chloride	2 ounces
Water	50 ounces

The solution must not be over-heated, and must be free from bubbles. The paper after floating is dried at a temperature of 60 deg. F., and will keep for years. It is sensitized on

Potassium bichromate	1 ounce.
Sodium chloride	½ ounce.
Ferricyanide of potassium	100 grains.
Water	30 ounces.

The paper is dried in the dark room, temperature about 70 deg. F. When dry it is exposed under the negative in an ordinary printing frame. Sunlight is preferable. The image will appear on the transfer paper, and when of a dark fawn color on a yellow ground it is sufficiently printed. It is then laid in a bath of cold water for about ten minutes until the soluble gelatine has absorbed its full quantity of water. It is then removed, placed on a flat plate, and all superfluous moisture removed with a piece of blotting paper.

The action of the light has been to render the parts to which it has penetrated through the negative partly insoluble, and at the same time granulated. A hard transfer ink is now composed of

White virgin wax	½ ounce.
Stearine	½ ounce.
Common resin	½ ounce.

These are melted together in a crucible over a small gas jet, and to them are added four ounces of chalk printing ink, and the mixture reduced to the consistency of cream with spirits of turpentine. A soft sponge is saturated with this mixture and rubbed gently over the exposed paper (in this stage the nature os the grain can be best seen). An ordinary letterpress roller charged with a little ink from the inking slab is then passed over the transfer, causing the ink to adhere firmly to the parts affected by the light, and removing it from the parts unacted upon. The transfer is next put into a weak bath of tannin and bichromate of potash for a few minutes, and when taken out the surplus solution should be carefully dried between clean sheets of blotting paper. The transfer is hung up to dry, and when thoroughly dry the whole of the still sensitive surface should be exposed to light for about two minutes. A weak solution of oxalic acid (about 1 in 100) should be used for dampening the transfer, and this applied to the back with a soft sponge. After it has been damped three or four times it is carefully removed and placed between clean sheets of blotting paper. A cold polished stone is then set in the press, and after everything is ready the transfer is placed on the stone and pulled through twice. The stone or scraper is reversed, and the transfer is again twice pulled through. A moderate pressure and a hard backing sheet should be used, care being taken not to increase the pressure after the first pull through., The transfer is taken from the stone without damping, when it will be found that the ink has left the paper clean. Gum up the stone in the usual way, but if possible let the transfer remain a few hours before rolling up. Do not wash it out with turpentine, and use middle varnish to thin down the ink.

---

* Various methods are employed to render the paper translucent. See under Translucent.

PAPYROTYPE or **PAPYROGRAPHY.**—A method of printing from paper or pasteboard covered over with a calcareous substance. A modification of photo-lithography, paper being used as a support in place of a stone.

PAPYROXYLINE.—A kind of pyroxylin made from paper. See **Pyroxylin.**

PARA-AMIDO-PHENOL (Formula C_6, H_7 NO, molecular weight 109).—A derivative of phenol or carbolic acid, a product of the distillation of coal tar and is prepared by the reduction of para-nitro-phenol or the nitro-phenol with tin and hydrochloric acid, crystallizes in fine needles, melts at 140 degrees C, is soluble in 90 parts of water and in 22 parts of absolute alcohol. It is used as a developing agent. A formula for its use will be found under **Developer.**

PARABOLA.—In conic sections, a plane curved of such a form that if from any point in the curve one straight line be drawn to a given fixed point, the other perpendicular to a straight line given in position, these two lines will always be equal to one another.

PARABOLIC LENS.—A lens ground to a parabolic surface would be entirely free from spherical aberration. It could only be ground, however, with veiy great difficulty, so that these lenses are no longer made, spherical aberration being nearly wholly overcome by other means.

PARABOLIC REFLECTOR.—See **Optics.**

PARAFFIN.—A solid, fatty substance occurring along with liquid oils in petroleum, and in the native state in coal and bituminous strata. It is a white, solid, translucent substance, without taste or smell. It takes its name from the fact that it is acted on with great difficulty by other substances.

PARAFFIN OIL.—See **Petroleum.**

PARCEL CAMERA.—An instantaneous camera made in the form of an ordinary brown paper parcel to avoid detection.

PARCHMENT PAPER can be made by immersing ordinary unsized paper in sulphuric acid, diluted with about half its volume of water. After a few moments it is withdrawn, and will be found to have assumed a new appearance, resembling animal parchment, and its strength is quite doubled. After immersion in the acid, it is washed in water, and in diluted ammonia, and again in water.

PARTITION.—Partitions in cameras are usually constructed of thin wood, or tin blackened over with a dull black varnish. They require to be fitted in stereoscopic cameras to prevent the two views from overlapping. They are also used—but rarely—when a subject is required to be taken upon which it is hardly worth while expending a large plate, to protect the remaining half from the light during the exposure.

PASTE.—A good flour paste may be made by working a little flour with cold water, and then pouring boiling water on it. An arrowroot paste may be made as follows: Thoroughly mix 600 grains of the best Bermuda arrowroot with 375 grains of cold water in a capsule. Next add 10½ ounces of water and 60 grains of gelatine in fine shreds. Boil for about five minutes, constantly stirring until the liquid becomes clear. Allow it to get cold, and then stir in two ounces of alcohol and about five to six drops of pure carbolic acid. This paste should be kept in well-corked bottles. See also **Mountant.**

PASTE, ENCAUSTIC.—See **Encaustic Paste.**

PASTE-DOWN MOUNT.—See **Mount.**

PASTEL PORTRAIT.—A photograph, usually an enlargement, worked over with chalk colors prepared by mixing fine pipeclay, gum, water, and the required pigment.

PATENT.—The following is the law relating to U. S. Patents:*

Suits for redress on account of infringement of patents are brought in the United States Circuit Court for the District where the defendent resides. Redress may be had through an injunction preventing further infringement and an accounting of the damages caused the patentee, or the profits, gains or advantages made by the infringer.

Until recently appeals from decisions rendered by the United States Circuit Court were necessarily taken to the Supreme Court of the United States, and, owing to the great amount of business done by the latter, a delay of at least four years was suffered by an appellee.

Very recently a new Court, designated the Circuit Court of Appeals has been provided. Appeals may hereafter be taken to this Court, and are likely to be reached and disposed of quite expeditiously. This is of particular advantage to patentees, in view of the fact that their monopolies run but a limited time.

Patents are issued in the name of the United States and under the seal of the Patent Office to any person who has invented or discovered any new and useful art, machine, manufacture, or composition of matter, or any new and useful improvement thereof, not known or used by others in this country, and not patented or described in any printed publication in this or any foreign country, before his invention or discovery thereof, and not in public use or on sale for more than two years prior to his application, unless the same is proved to have been abandoned; and by any person who, by his own industry, genius, efforts, and expense, has invented and produced any new and original design for a manufacture, bust, statue, alto-relievo or bas-relief; any new and original design for the printing of woolen, silk, cotton, or other fabrics, any new and original impression, ornament, pattern, print, or picture to be printed, painted, cast, or otherwise placed on or worked into any article of manufacture; or any new, useful, and original shape or configuration of any article of manufacture, the same not having been known or used by others before his invention or production thereof, nor patented or described in any printed publication, upon payment of the fees required by law and other due proceedings had.

Joint inventors are entitled to a joint patent; neither can claim one separately. Independent inventors of distinct and independent improvements in the same machine can not obtain a joint patent for their separate inventions; nor does the fact that one furnishes the capital and another makes the invention entitle them to make application as joint inventors; but in such case they may become joint patentees.

Every patent contains a grant to the patentee, his heirs or assigns, for the term of seventeen years, of the exclusive right to make, use, and vend the invention or discovery throughout the United States and the Territories, referring to the specification for the particulars thereof.

If it appear that the inventor, at the time of making his application, believed himself to be the first inventor or discoverer, a patent will not be refused on account of the invention or discovery, or any part thereof, having been known or used in any foreign country before his invention or discovery thereof, if it had not been before patented or described in any printed publication.

Letters Patent granted a foreign government will not, while in force, prevent the inventor from obtaining a patent in the United States, unless the invention shall have been introduced into public use into the United States more than two years prior to the application. But every patent granted for an invention which is the subject of Letters Patent still in force and previously granted to the same inventor in a foreign country will be so limited as to expire at the same time with such foreign patent, or, if there be more than one, at the same time with the one having the shortest unexpired term, but in no case will it be in force for more than seventeen years.

Applications.—Application for a patent must be made in writing to the Commissioner of Patents. The applicant must also file in the Patent Office a written description of the same, and of the manner and process of making, constructing, compounding and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art or science to which it appertains, or with which it is most nearly connected, to make, construct, compound, and use the same; and in case of a machine, he must explain the principle thereof, and the best mode in which he has contemplated applying that principle, so as to distinguish it from other inventions, and particularly point out and distinctly claim the part, or improvement, or combination which he claims as his invention or discovery. The specification and claim must be signed by the inventor and attested by two witnesses.

The applicant shall make oath that he verily believes himself to be the original and first inventor or discoverer of the art, machine, manufacture, composition, or improvement for which he solicits a patent; that he does not know and does not believe the same was ever before known or used, and shall state of what country he is a citizen. Such oath may be made before any person within the United States authorized by law to administer oaths, or, when the applicant resides in a foreign country, before any minister, charge d'affairs, consul, or commercial agent holding commission under the Government of the United States, or before any notary public of the foreign country in which the applicant may be.

---

* From "American Annual of Photography."

When the nature of the case admits of drawings, the applicant must furnish one copy signed by the inventor or his attorney in fact, and attested by two witnesses, to be filed in the Patent Office. In all cases which admit of representation by model, the applicant, if required by the Commissioner, shall furnish a model of convenient size to exhibit advantageously the several parts of his invention or discovery.

On the filing of such application and the payment of the fee required by law, if on such examination, it appears that the claimant is justly entitled to a patent under the law, and that the same is sufficiently useful and important, the Commissioner will issue a patent therefor.

Assignments.—Every patent or any interest therein shall be assignable in law by an instrument in writing; and the patenteee, or his assigns or legal representatives may, in like manner, grant and convey an exclusive right under his patent to the whole or any specified part of the United States.

Reissues.—A reissue is granted to the original patentee, his legal representatives, or the assignees of the entire interest when, by reason of a defective or insufficient specification, or by reason of the patentee claiming as his invention or discovery more than he had a right to claim as new, the original patent is inoperative or invalid, provided the error has arisen from inadvertence, accident, or mistake, and without any fraudulent or deceptive intention. The applications must be made and the specifications sworn to by the inventors, if they be living.

Caveats.—A caveat under the patent law is a notice given to the office of the caveator's claim as inventor, in order to prevent the grant of a patent to another for the same alleged invention upon an application filed during the life of the caveat without notice to the caveator.

Any citizen of the United States who has made a new invention or discovery, and desires further time to mature the same, may, on payment of a fee of $10, file in the Patent Office a caveat setting forth the object and the distinguishing characteristics of the invention, and praying protection of his right until he shall have matured his invention. Such caveat shall be filed in the confidential archives of the office and preserved in secrecy, and shall be operative for the term of one year from the filing thereof.

An alien has the same privilege, if he has resided in the United States one year next preceding the filing of his caveat, and has made oath of his intention to become a citizen.

The caveat must comprise a specification, oath, and, when the nature of the case admits of it, a drawing, and, like the application, must be limited to a single invention or improvement.

Fees.—Fees must be paid in advance, and are as follows: On filing each original application for a patent, $15. On issuing each original patent, $20. In design cases: For three years and six months, $10; for seven years, $15; for fourteen years, $30. On filing each caveat, $10. On every application for the reissue of a patent, $30. On filing each disclaimer, $10. For certified copies of patents and other papers, including certified printed copies, ten cents per hundred words. For recording every assignment, agreement, power of attorney, or other paper, of three hundred words or under, $1; of over three hundred and under one thousand words, $2; of over one thousand words, $3. For copies of drawings, the reasonable cost of making them.

PATENT PLATE.—See **Glass.**

PEARLASH.—A crude potassium carbonate obtained from the ashes of plants by dissolving the calcined mass in water, decanting the clear solution, and evaporating it to dryness in flat iron pans. By constant stirring towards the end of the process the pearlash is obtained in a semi-granular state. It is very impure, containing variable quantities of potassic silicate, sulphate, chloride, etc.

PELLET'S PROCESS.—A process of printing with salts of iron, giving blue lines, on a white ground. The most recently given formula is the following:

Gum arabic	385 grains
Sodium chloride	46 grains
Tartaric acid	62 grains
Perchloride of iron	123 grains
Water	3½ ounces

Well-sized smooth paper is evenly coated with the mixture, dried in the dark, and exposed beneath the negative The image is developed in a saturated solution of ferrocyanide of potassium, and fixed in a 1 in 20 solution of hydrochloric acid. See also **Cyanotype.**

PELLICLE.—A thin skin or film. Photographically it is applied to a coating of an emulsion when the solvents have evaporated. Many attempts have been made to use gelatine or collodion pellicles without the necessity of the glass support. See **Film.**

PENCIL OF LIGHT.—A term applied to rays of light diverging from or converging to a point. If the point is taken at an infinite distance the rays are then usually regarded as parallel, the amount of divergence or convergence being so small, and the pencil then becomes a beam of rays.

PENCILS.—Pencils are used in photography chiefly in retouching negatives; for this purpose H to H H H H H H pencils are the most suitable. See **Retouching.**

The following recipes* for preparing pencils for writing on glass, porcelain, metal, etc., may be found useful:

Black.

Finest lampblack	10 parts
White wax	40 parts
Tallow	10 parts

White.

Kremser white	40 parts
White wax	20 parts
Tallow	10 parts

Light Blue.

Prussian blue	10 parts
White wax	20 parts
Tallow	10 parts

Dark Blue.

Prusian blue	15 parts
White wax	5 parts
Tallow	10 parts

Yellow.

Chrome yellow	10 parts
White wax	20 parts
Tallow	10 parts

The color is mixed with the body of wax and tallow while warm, triturated, exposed to air for drying, so that the mass can be pressed by means of a hydraulic press into round pencils in the same way as lead pencils are formed. The pencils are dried after pressing by exposing them to the air until they have the proper consistence, and are then glued into wood.

PENDULUM.—A simple pendulum is a heavy particle suspended by a fine thread from a fixed point about which it oscillates without friction. No simple pendulum can of course exist. All made by man are compound, in which there gravitates, not a particle, but a heavy body called a bob, and the laws of friction must also be considered.

The time of vibration of a pendulum is directly as the square root of its length, and inversely as the square root of the accelerating force of gravity. The length of the arc through which it vibrates does not affect the result.

The knowledge of the construction of a seconds pendulum, will sometimes be useful in timing exposures when a chronometer is not handy. All that is required is to get the exact length. This differs in direct proportion to the force of gravity at the place. In London (lat. of Greenwich Observatory, 51 deg. 28 min. N.) at the sea level the exact measure required is 39·13983 inches.

PENNY PHOTOGRAPH.—A photograph obtained for one penny. Machines have recently been constructed with which, if a coin of the value of one penny is placed in a slot, the machinery is set in motion, and a ferrotype plate exposed, developed, fixed and dried. The construction of these machines is given under **Automatic Machines.**

PERCHLORIDE OF GOLD.—See **Gold Trichloride.**

PERCHLORIDE OF MERCURY.—See **Mercuric Chloride.**

PERFORATED BASE-BOARD.—In many makes of cameras the base-board, instead of being solid, has a large round hole cut in the center, or is constructed as a framework only. These are termed perforated base-boards, and by their use the lens need not be removed from the camera when folding it up, as it falls through the hole in the base-board, and is always in a position ready for use. Much time is, of course, saved by this arrangement; it is only necessary to see that the base-board still remains firm and rigid.

PERFORATING GLASS.—To make a hole in glass, an ordinary well-tempered steel drill is the best tool. The drill must be kept moistened with turpentine in which some camphor has been dissolved, or with diluted sulphuric acid, or with ordinary kerosene oil.

---

* "British Journal Almanac," 1891.

PERISCOPIC LENS.—See **Lens.**

PERMANENCY.—The question of the permanency of photographic images is one that has been much discussed. It is a well-known fact that silver prints made thirty or forty years ago have almost entirely faded away. Here and there prints will be found of that age in quite good condition, the reason lying, in all probability, in the method of manufacture adopted. It is pretty generally known that hypo remaining in the picture will soon cause it to fade. To thoroughly eliminate this, several so-called hypo eliminators have been recommended. These should never be used, for while removing the hypo from the film they leave another composition which is more likely to cause the print to fade than the hypo salt itself. Good washing is the only true eliminator. This must be thorough and not too long. Too prolonged washing tends to decompose the prints, and will cause them to fade more rapidly. The larger the quantity of gold used in the toning process, the longer will be the lasting qualities of the prints. This should be borne in mind by those economical workers who endeavor to make a tube of gold tone a large number of sheets. Another cause of fading is due to impurities in the mount and the mountant. Unmounted prints placed between sheets of chemically pure paper will last considerably longer than mounted ones. Good quality mounts and a pure, simple paste should be used.

Silver prints are probably the least permanent of any photographic pictures. Gelatino-chloride of silver papers (Celerotype, Aristotype, etc.), are much more permanent than albuminized paper.

Bromide and platinotype prints are also considered as permanent.

The most permanent are undoubtedly the pictures produced by the carbon or Woodbury process. In these the images are composed simply of gelatine and lampblack, two permanent substances.

PERMANENT SUPPORT.—See **Carbon Process.**

PERMANGANATE OF POTASH.—See **Potassium Permanganate.**

PERNITRATE OF IRON.—See **Ferric Nitrate.**

PEROXIDE OF HYDROGEN.—See **Hydrogen Peroxide.**

PERSPECTIVE.—See **Plane Perspective.**

PERSULPHATE OF IRON.—See **Ferric Sulphate.**

PETROLEUM.—Synonyms, *earth oil*, *mineral oil*, *paraffin oil*, etc.)—A term applied to a variety of inflammable liquids found in different parts of the earth. A light petroleum oil is much used for illuminating purposes. Many optical lanterns are constructed for burning petroleum. The whiteness of the light obtained may be increased considerably by dissolving a little camphor in the oil (about one ounce to the pint) before lighting.

PHANTASMOGRAPH.—A name given to an apparatus for printing lantern slides. It consists of a long box, at one end of which the quarter-plate negative and the lantern plate in contact with it are placed. The hinged door at the other end of the box admits the light for exposure. By this means all side or extraneous light is excluded.

PHENIC ACID.—See **Carbolic Acid.**

PHENOL.—See **Carbolic Acid.**

PHENOL PHTHALEIN (Formula, $C_{20}H_{14}O_4$; synonym, *dihydroxy-diphenylphthalide*).—A substance employed in an alcoholic solution as a test for organic acids. No alteration takes place with these, but if alkali be present its color is changed to a reddish purple. This test, however, cannot be relied on in the presence of ether, ammonia, or carbon dioxide. It is insoluble in water.

PHENYL HYDRATE.—See **Carbolic Acid.**

PHOSPHATE.—A salt of phosphoric acid. The principal are phosphate of ammonia, copper, iron, lead, calcium and soda. Soluble phosphates give with barium nitrate a white precipitate soluble in hydrochloric acid, and with silver nitrate a yellow precipitate soluble in nitric acid.

PHOSPHORESENCE.—The property possessed by many substances of emitting light under certain conditions.

PHOSPHORESCENT PHOTOGRAPHS.—See **Luminous Photographs.**

PHOTO CERAMICS.—A process of producing burnt-in photographic images on porcelain, pottery, glass and other similar materials. There are two principal methods—the substitution process invented by Du Motay and Maréchal, and the dusting-on process of Poitevin.

The best description of the substitution process is that of Mr. N. K. Cherrill, and from which the following information is mostly taken :*

A piece of glass is first cleaned with nitric acid, well washed, dried, polished, and coated three times with the collodion.

This done, the plate is plunged into the nitrate bath before the collodion has been allowed to become too much set. The nitrate bath is a solution of thirty grains of pure silver nitrate dissolved in an ounce of pure water, and sunned all the while it is not in use, and when used rendered acid in the proportion of two drops of pure nitric acid to a half-gallon of solution. The plate is left in this solution until all the greasy marks have disappeared ; it is then taken out at once and placed in a funnel to drain for about five minutes, and is then inserted in the dark slide of the copying camera. The camera is so arranged that the light which passes through the negative to be copied comes only through one of the side lights of the studio. The exposure varies from five to twenty seconds. If the enamel to be taken is of small size it is preferable to put a mask on the negative and to block out all the light except that actually needed, as this enables one to take four or five images side by side by simply pushing the camera dark slide a little way each time. The exposure and development of the image is a matter requiring great care and attention, as on the complete success of the transparency the whole process lies. The developing solution is made up with—

Pyrogallic acid	12 grains
Glacial acetic acid	4 drachms
Alcohol	4 "

Water to fill a 12 oz. bottle.

In warm weather this may be more dilute—say as far as giving 20 ounces of water to the same quantity of pyro. Then, of course, more alcohol will be needed. The developer should be made three days before required for use, as at first it is too vigorous, although it must not be kept too long, as it then deteriorates in the other direction.

The image of the positive is developed slowly and until it obtains the exact density required, and at the same time gives the right amount of detail in the high lights. The image, when examined by reflected light, should show nearly all the drawing and shading of the subject, while, when viewed by transmitted light, it would show up with great perfection.

The plate is then well washed and fixed with a weak solution of cyanide of potassium, after the application of which it is again thoroughly well washed.

After washing, a small portion of the film at one corner of the plate is broken away, and a direct stream of water is made to run on this corner, striking the bare glass. This will gradually detach the film from the glass. The detached film is then floated on to a clean piece of glass and all unnecessary parts removed. The film is again washed while on the glass, and then lowered gently into a dish of water.

The next operation is the toning. A 16-ounce bottle, half-filled with water, is placed in a saucepan containing water. This arrangement is set on the fire or on a gas stove until the water in the pan begins to boil. Next is placed in the bottle an ounce of potassium-chloride of iridium, and it is filled up with cold water and returned to the saucepan. The water is then kept hot and the bottle shaken occasionally. After half-an-hour remove the bottle and place it where the contents will become quite cold. To make up the toning bath place twelve ounces of pure water in a bottle ; add to it 14 drachms of the iridium solution, and shake up well. Now add drop by drop, and shaking well between each addition, seven drachms of a solution of gold chloride (1 grain to 1 drachm). The bath is then ready for use, but improves by keeping, which it will do indefinitely. It is particular to note that the solution in the iridium bottle will have a nearly black sediment, which is undissolved chloride. When all the clear solution has been used up, more water is added, and this remainder used in the same manner as the first, but care being taken, however, that too much water is not added, as a quarter of an ounce of the chloride will not make two sixteen ounce bottles full of the saturated solution, but only about one and a half.

To use the bath, pour it into a dish to the depth of about half-an-inch, and have ready at hand another dish containing clean water, and a small dish containing some pieces of glass somewhat smaller than the films to be toned. Now take one of these pieces of glass, and slip it under the film containing a transparency to be toned, and gently raise the glass to the surface (at the same time manipulating the film with a camel-hair brush, held in the right hand) in such a manner that when the glass and film on it are lifted out of the water there will be an edge of film about a quarter of an inch wide lapping over one edge of the glass. The action of the water as the plate is taken out will wash this piece or edge of film round to the back of the plate, and by so doing will fix the transparency on the glass in a very satisfactory manner. If care be taken that the edge where the film laps over is kept uppermost or highest, a very considerable stream of water may be poured on the film without any danger of it slipping. Having got the film on the glass it should be rinsed under the tap, and can then be transferred to the toning bath. To do this, turn the glass over so that the body of the film is underneath, lower it gently under the surface of the solution, and with a brush disengage the lap of the film where it had turned over the edge of the plate, now, of course, uppermost. As soon as this is done the film will move off into the solution free of the glass, which can then be removed. When the film has floated free for about a minute turn it over with a brush and note carefully if the deeper shadows are toned through, so as to give one uniform tint to the whole film. When this is effected it is removed with the piece of glass used in the same manner as before described and transferred to a dish of cold, clean water. Free it from the glass and gently agitate the water to remove the toning solution adhering to it As each film is toned it is placed in this dish of water, and when all are finished they are changed to another dish of cold water, taking each film up with the glass as before described.

---

* Photographic Year Book, 1886.

The films are then ready for mounting on to the tablets. Have two dishes, one containing cold water, and another filled about half an inch deep with ammonia solution.

Ammonia .880	6 drachms
Water	12 ounces

(Keep well corked.)

Half an ounce of this mixture diluted with one pint of water makes the bath into which the films are to be plunged.

Place in the dish of clean water a clean glass, and on that an enamel tablet carefully washed. Take another glass, and with it remove one of the toned films from the dish in which it was washed, and plunge the same into the ammonia bath. As the film enters the solution the time is noted by the second hand of a watch, and after it has been in twenty seconds it is removed and plunged quickly into the water where the tablet is. Disengage the glass and slightly agitate the water in the dish to give the film a wash. Then take up with the left hand the piece of glass on which the tablet rests, and raise it about half way to the surface, then, manipulating with the brush, bring it into its proper position on the tablet. It is then removed and placed slightly on edge to drain.

The tablets being curved, it is necessary to remark that a little care must be taken in the manipulation in order to make the films lie flat.

When almost dry the tablets are to be removed from the glass plates upon which they were lifted from the water. To do this, place the plate in a level position, and with a sharp-pointed stick tear away the useless film around the edges of the tablet, slip a thin knife under the latter, and lift it off the glass on to a sheet of blotting paper, and cover over with a bell jar or similar contrivance to protect from dust.

The next process is the burning-in; this may be done at once, or it may be left for weeks without any change.

A gas muffle furnace should be used in preference to one heated by coke. Whichever is used, however, it should be ready and at the full heat, a clear cherry red inclining to white, but by no means a full white heat. Too much heat is a mistake, as it renders the process quite unmanageable, and produces no better results for the extra difficulty in working.

Figures 329–330 illustrate the furnace used.*

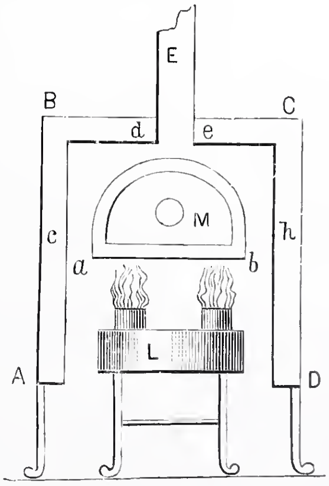


FIG. 329.

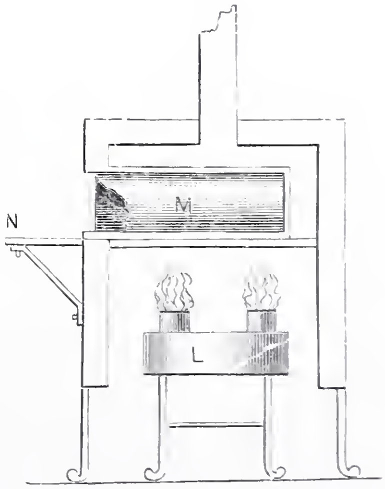


FIG. 330.

When enamels of small size only are attempted, the form here illustrated and described will do good work. Its construction is so simple that any good metal worker can construct it.

Fig. 529 is the front elevation, and Fig. 330 the side elevation. The muffle, M, is made of moderately thick sheet brass, permanently closed at one end, with a hinged or sliding door, provided with a peep-hole in front. The muffle slides into the furnace on two iron bars let into the walls. One of these bars is seen in Fig. 330.

The furnace walls, A, B, C, D, Fig. 329, are of thick iron plate and doubled, the space between being filled with ashes or some other non-conductor of heat. The furnace is supported by four iron legs attached to the outer wall by screws, in order to be easily removed for convenience of transportation. A chimney, E, also detachable, fits into a hole in the middle of the furnace top. Heat is generated by a Berzelius or Liebig spirit lamp, having two or more wicks, which stands on an iron tripod.

The opening in the walls by which the muffle is introduced into the furnace must be of such a size and shape as to be completely closed when the muffle is in place. A shelf, N, of thick iron plate, is fastened by brackets just underneath this opening.

---

* Burbank's Photographic Printing Methods.

It is impossible to give any specific dimensions, as they are determined by the size of the muffle, which must be large enough to hold the largest piece of enamel likely to be fired.

The height of the muffle need not be more than three inches, nor its other dimensions more than seven by nine inches. A muffle four by five, by two-and-one-half inches, is, perhaps, as large as can be advantageously used in this simple form of furnace. The furnace proper should be about seven inches high, and the legs about the same. The chimney is a piece of iron pipe two inches in diameter, and about fifteen inches in height. The hot-air space surrounding the muffle may be one or two inches larger each way. The lamp must not be brought too near the bottom of the muffle, or it will not burn well.

The burning is the most delicate operation, and every care is necessary to secure the result at the very best point.

Take one of the tablets and place it upon a piece of fireclay in front of the muffle at a distance of about six or eight inches. The fireclay should be supported in such a way as to tip the enamel towards the heat, so that the rays may fall upon it as near as possible equally all over. When it is roasted in this manner it is moved a little nearer, and then a little nearer, examining it each time. As soon as the heat has turned the color of the film brown in the least degree it may be dealt with fearlessly. The fireclay with the enamel on it may be placed level, just in the mouth of the muffle, where, in a few moments, the film will take all the shades of brown until it gets quite dark, when it is pushed into the heat. As soon as it is pushed in the heat it must be watched carefully. It will appear to get perfectly black all over, and then, all of a sudden, the whites of the picture will be seen coming out quite clear. Directly this takes place draw the tablet to the mouth of the muffle and remove it to the outside to cool a little gradually, and then take the tablet and place on a piece of wood to get cold. All the beauty of the enamel will by this time have disappeared, the whites will stand out, and the few tones near them will have some clearness, but all the other tones will be a dark and confused mass, hardly distinguishable one from the other. This is the true characteristic of a good enamel at this stage. It is now ready to glaze.

The enamel glaze is made in large quantities at Worcester, and can be bought in the form of a fine powder resembling flour. Place about a thimbleful of this in a bottle, and add an ounce of alcohol. To make the glazing solution, take a two-ounce bottle, and put into it half-an-ounce of plain collodion, and add to it a quarter of an ounce of methylated ether and half an ounce of alcohol. Next add as much water as possible without precipitating the pyroxyline. About six or eight drops will suffice. Shake up the bottle containing the glaze in alcohol, and let it remain for a few minutes, and then carefully add some of the upper part of the mixture to the diluted collodion—sufficient to make it slightly opaque.

When the enamel is quite cold some of this glaze mixture is poured over it, and it is immediately tilted to allow the superfluous glaze to run off. When the collodion is set, place the tablet in a muffle on a piece of fireclay, and gradually introduce it to the full heat, keeping careful watch that the burning does not proceed too far. The glaze should only just melt, when the enamel should be pulled out again, and placed on the wood block to get cold once more. The image is now fixed indelibly, but the picture is not, however, at its full beauty, as one glazing will not be sufficient; thedark portions would still retain a matt appearance. This is overcome by repeated glazing, no enamel being perfect until it has been glazed five or six times. A little trouble might be saved by lessening the number of burnings and making the glaze thicker, but the best results are not obtained in this manner.

By this process we obtained an image consisting of pure metallic silver, gold, and iridium in an extremely fine state of division fixed to the surface of an imperishable tablet, and protected by an equally hard, permanent and impermeable glaze.

Ceramic colors may be applied to enamels, and burnt in in the same manner.

Enamel may be retouched with a medium prepared by burning waste films and trimmings in the muffle, collecting the ash, and adding to it a small quantity of the glaze powder and a drop of an essential oil. The work being burnt into the enamel takes the same color and surface as the rest of the picture. With enamels that have been spoiled, the image can be removed with a little fluoric acid, and the tablet used again.

PHOSPHORETTED HYDROGEN. (Synonym, hydrogen phosphide).—Obtained in three forms—gaseous, liquid and solid. The gaseous phosphide (H_3P) is prepared by heating hydrated phosphorus acid in a small retort. It has a disagreeable odor, is slightly soluble in water, and burns with a brilliant flame.

Liquid phosphide (H_2P) is obtained in small quantities when calcium phosphide is treated with water. The gas evolved is passed through a tube surrounded by a freezing mixture, which condenses this compound as a colorless and highly refractive liquid. In contact with air it inflames instantly. Solid phosphide is HP_2 formed by the action of light on liquid phosphide.

PHOSPHORUS, (Symbol P; atomic weight, 31).—A non-metallic element found in the unstratified rocks, the soil, the organism of plants, and the bodies of animals. It is insoluble in water, but soluble in ether, chloroform, benzine, turpentine, and other oils and carbon bisulphide It can be prepared artificially from bone ash or other phosphates by treatment with two-thirds of their weight of sulphuric acid and water and sublimation with charcoal and sand. It has but little interest photographically. It is sold in sticks, which must be kept in bottles filled with water.

PHOTO.—Pertaining to or relating to light. Also used as an abbreviated term for photograph.

PHOTO AQUATINTS.—A process for printing pictures from intaglio copperplates. The process is said to be much simpler than photogravure, which it resembles.

PHOTO CARICATURES. (See **Caricature photos.**)—Humorous portrait photographs can be made by several different methods. The simplest is perhaps by holding under the head of the sitter a white card having a small body. A white back ground is used, so that in the photograph a large head and a little body is all that appears. See fig. 331.

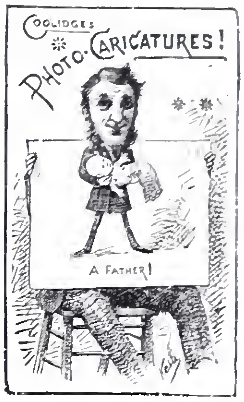

COOLIDGES
PHOTO-CARICATURES!
A FATHER!

PHOTO CARICATURE.
FIG. 331.

PHOTO CAUSTICS.—A name given to photo-lithographs produced in half-tone by means of a Meisenbach ruled negative.

PHOTO=CHROMOSCOPE.—An arrangement for showing photographs tinted with different colors. It consist of a frame opening not unlike a retouching desk, this frame being arranged to support the picture in a suitable position in front of reflectors. To use it unmounted photographs are taken and the skies cut away, the photograph then being rendered transparent by a suitable medium. The transparent photograph is then placed upon the glass front of the instrument whilst behind it, in a suitable position is a sheet of artificial clouds which are tinted blue, and by the use of a series of colored pieces of cardboard of various tints the light from which is reflected through the picture, a variety of pleasing effects such as night, sunset, sunrise and so on may be obtained.

PHOTOCHROMY.—Photography in colors. See **Heliochromy.**

PHOTO=CHRONOGRAPHY.—(See **Chrono-photography.**)

PHOTO=CHEMICAL ACTION.—See **Photographic chemistry.**

PHOTO=COLLOGRAPHIC PROCESS.—A simplified process. See **Warneke's process.**

PHOTO COLLOTYPE.—See **Collotype.**

PHOTO CRAYON PROCESS.—A process introduced by Sarony about the year 1870. It contained in making a photographic transparency on glass, which was afterwards backed up with paper, on which a number of lines, hatchings, or stippling were lithographed, giving the portrait the appearance of a crayon work.

A similar process adopted by Henderson is the following:—A piece of course ground glass is laid over a portrait, and the glass worked on with a lead pencil or crayon all round, and, if necessary, over the lower part of the figure. The ground glass when viewed by transmitted light will then represent beautiful broken up granular markings. A thin negative is then made from this ground glass from transmitted light, reduced or enlarged as required. This negative to be superimposed with the negative to be enlarged or reproduced, which when developed, will contain all the worked up effects on the ground glass.

PHOTO ELECTRICITY.—The generation of electromotive forces and currents by the action of light on various metallic plates having their surfaces prepared by special processes. The most recent experiments in this direction have been made by Professor G. M. Minchin.* He uses two kinds of cells. One of them consists of a glass tube three or four inches long, in which is some pure methyl alcohol from oil of wintergreen, covering the two plates; platinum wires, sealed into the tube by heat, pass through the glass to the plates. This smaller plate is of absolutely clean, pure tin, a quarter of an inch long, a sixteenth of an inch broad. The larger and sensitive plate is one inch long and one-eighth of an inch broad. This one also is of perfectly pure tin, for any impurity, especially any trace of copper, promotes failure in the results. The plate is first cleaned with sodic hydrate, and afterwards with dilute hydrochloric or hydrofluoric acid; then it is laid upon a horizontal arm of porcelain so bent at the other end that, on raising from below a dish containing liquor, the said liquid covers the plate. By this method the

---

"Photographic News," January 23rd, 1891.

second plate, or the one which has to be covered with a sensitive film, is immersed in the following solution :—

Distilled water	500 c.c.
Nitric acid	3 "
Nitrate of ammonia	15 grammes.

The plate is left in the liquid about four minutes, and becomes covered uniformly with a whitish deposit. The solution is then removed by lowering the dish, and the under surface of the horizontal porcelain support is dried with blotting paper. This dried under surface is then uniformly heated with a spirit flame moved about underneath until the liquid above has evaporated; the surface of the tin plate will then present a dirty slate color. As the heating is continued, a point is reached at which a dark shadow passes over the whole surface of the plate ; if the heating be now stopped, sensitive plate is produced, but not one of the maximum sensitiveness. Upon continuing the heat the surface will change into a perfectly white one, and the heating should be continued until the thin vapor or smoke which is given off ceases to appear, and until the smell of nitrous acid entirely disappears. Care must be taken not to melt the tin in this process, and when the treatment is complete, the plate should be plunged into methyl alcohol from pure oil of wintergreen A fine platinum wire has first to be fixed to the top of the plate, either by means of solder with a low melting point, or by passing a wire through a little hole at the top of the plate and then bending the end of the wire back over the top edge ; the latter plan is found to give sufficiently good contact for practical purposes. The clean, plain tin plate is sealed to the bottom of the tube by means of its platinum wire ; after the methyl alcohol and the other plate are inserted, the upper part of the tube, with the wire from the second plate passing through it, is sealed by heat. All this may be done in daylight. The complete cell has to be left from two to five hours in the dark before it will exhibit its maximum powers.

The tin plate thus rendered sensitive, and mounted in a cell as described, when exposed to good diffused daylight will exert an electromotive force—E M.F. in electricians' language—of half a volt or more, as exhibited by means of the quadrant electrometer, and it will yield a steady stream of electricity for three or four hours, after which the E.M.F. falls off.

Supposing an exposure not to have been too long, the cell will gradually recover itself in the dark ; if it be not exposed for more than ten minutes or so at a time it will recover itself in the dark ; one of the cells which has been used only in the latter manner has been so employed by Professor Minchin for four years.

Photo electricity is yet in its infancy, but there are many who believe that it has a great future before it. Among the many possibilities are mentioned * a scientific comparison of the relative values of two different lights, the solution of the problem of telephotography, or seeing at a distance, also the question of utilizing the energy of the solar rays for performing useful work by means of photo-electric batteries.

PHOTO-ELECTROTYPE.—A very large number of processes come under this heading. They all consist substantially in first exposing a sheet of chromatized gelatine under a negative. If half-tone effects are to be produced, grained or lined negatives must be used. The effect of the light shining through the negative is to render some parts insoluble and incapable of absorbing water. After exposure the gelatine is either soaked in water to swell the remaining soluble parts, or it is treated with a warm water or an acetic acid bath to wash them right away, leaving the insoluble parts to form an image in relief. From these, moulds in wax or plaster are made, from which a copper relief block for typographic printing is made by the electrotype process.

PHOTO-ELECTROGRAPH.—An arrangement used at Kew observatory for photographically registering the variations of the electrical conditions of the atmosphere.

PHOTO-ENGRAVING.—The earliest process of engraving with the aid of photography was the bitumen process of Niepce. This was, in fact, the earliest process of obtaining permanent images by the action of light. Niepce discovered that certain varnishes became insoluble by the action of light ; he covered metal plates with asphaltum or bitumen of Judea, and exposed them to the image in the camera obscura. After the exposures the plates were treated with a solvent, when the unexposed parts were dissolved away, leaving the insoluble negative image of bitumen on the metal plate. To convert this into a positive one, the plate was treated with iodine vapor, which attacked those parts of the metal unprotected by the bituminous image, which was then cleared away with a powerful solvent. By applying an acid to the bituminous images on metal the bare parts are eaten away, and by this means engraved plates were obtained. See **Niepceotype.**

Bolas, the eminent authority upon photo-mechanical processes, thus described the *modus operandi* for producing photo-engraved plates by the bitumen process :—" Bitumen or asphalt dissolves readily in benzole, and the solution runs freely through a paper filter. The solution should not be quite as thick as collodion. A carefully-cleaned copperplate such as the engravers use, is clamped down on to a turn-table. The next step is to flood the plate with bitumen solution, and then to make the table revolve quickly. When it has revolved a few seconds the film will be dry. No other method gives such a uniform and compact film of bitumen as this. After coating it is well to put the plate aside for twelve hours, in order that the film may become harder. It is then necessary to dust it over with French chalk to remove stickiness, and after this it is placed behind a transparency and exposed to light. The time of the exposure may vary from 20 minutes to two days.

---

* Professor Minchin at the Physical Society.

When a plate has had the requisite exposure, the next matter is to dissolve away that portion of the bitumen which has not been made insoluble by the action of light. Now, benzole is generally too energetic a solvent for the purpose, and oil of turpentine is often not sufficiently active; but by mixing these together you can get any degree of solvent power which you may require. The workman commences by flooding the plate with oil of turpentine, and if this has not sufficient action he pours it off and adds a little benzole; this begins to produce an effect, and enables him to judge as to the amount of benzole which he may safely add to the oil of turpentine. When he has added this quantity, and has washed away all the soluble bitumen from the plate, it is next thoroughly rinsed with water to remove the oil of turpentine. The plate is next placed in nitric acid, so as to etch the lines where the metal is bare.

Plates from which much printing is to be done are ordinarily covered with a thin film of iron, by the electrolytic method, and as the film of iron is extremely thin, it does not in any way interfere with the printing qualities of the plates. When the surface of a plate begins to wear a little, and the impressions show signs of deterioration, the film of iron is dissolved off by means of dilute sulphuric acid, leaving the copperplate as good as ever. The film of iron, although so thin as not to injure the printing qualities of the plate, is nevertheless sufficiently thick to protect the copper from injury in printing. The plate having been freed from the first worn-out film of iron, is once more coated with a layer of iron, and is again ready for use. When the second film of iron is nearly worn away, and the printer approaches near to the true surface of the copperplate, the iron is again dissolved away, and a new coating of iron is put on. According to this system, one really prints rather from a cast of the plate than from the original plate, and new casts are made as required.

Another method of producing photo-engraved plates from lined subjects is by means of photo-lithographic transfer, the process being similar to photo-lithography, except that a metal plate is being used instead of the stones.

Major de la Nöe's process of photo-engraving, which he terms typogravure, is really an intaglio process, although the printing is similar to ordinary zincography. A prepared zinc plate is coated with a film of sensitive bitumen as already described, and the exposure made under a tracing or a transparency, and the plate afterwards developed in the usual way. The plate is then etched with dilute nitric acid until the depth of about $\frac{1}{250}$th of an inch is reached. The plate is then dried and again coated over with bitumen. The ground is next polished off with a stick of charcoal, leaving the bitumen on the lines, after which the plate is gummed and printed from as in zincography.

Klie's process is the following: A copperplate is dusted over with powdered asphalt, and the plate heated until the particles of asphalt just adhere to the plate. A negative carbon process is then transferred to the copperplate, and the latter is then etched with a strong solution of perchloride of iron. By diluting the solution its action increases; water is consequently gradually added until the solution etches through the thicker parts, until only the high lights remain unetched.

A simple method of photo-engraving line subjects, much practiced on the Continent, is the following: A copperplate is first coated over with a film of bichromated albumen and exposed under a negative; the plate is then washed with cold water, and etched with an alcoholic solution of ferric chloride.

The following details will be sufficient to enable the method to be carried into practice * One hundred cubic centimeters of albumen are mixed with a solution of two and a half grammes of bichromate of ammonia, in fifty cubic centimeters of water, and, after having been well beaten, the mixture is filtered. A carefully cleaned plate of copper is now coated with the mixture, and after the excess has been well drained off, the plate is dried at a very gentle heat, it being retained in a horizontal position meanwhile. The exposure required is by no means a long one, half a minute in moderate sunshine being sufficient in ordinary cases; but this must, of course, be learned by experience. Instead of developing (washing away the unaltered albumen) in plain water, it is better to use a weak solution of aniline red or magenta dye, as under these circumstances the ground becomes tinted, and the progress of the development can be watched. When the plate has been dried, nothing now remains but to varnish the back and edges with an ordinary black varnish, such as the so-called Brunswick black, and to etch. The etching bath is made by dissolving one part of perchloride of iron in five of alcohol, and ten minutes is generally sufficient time for etching to the required depth.

---

* T. C. Bolas on "Photo-mechanical Printing."

Major Waterhouse succeeded in perfecting a process of photo-engraving with intaglio plates, his method being a modification of a process previously introduced by Geymet. The process is based upon the reticulation of a Woodbury relief.

A Woodbury relief (see **Woodburytype**) is first developed upon a plate of silvered copper. The relief need not be quite so high as required for the Woodburytype process; ordinary carbon tissue may be used. When the relief has been developed and washed, it is immersed in a solution of potassium dichromate, drained and dusted over with very fine sand previously waxed by heating in an iron pot, and stirring up with a small quantity of wax. The waxed sand is now allowed to remain on the film until quite dry. When dry it is brushed off, and it will be found to have granulated or pitted the gelatine image, the pits being deepest in the thicker parts. The next process is to blacklead the plate, and make a cast in the electrotype bath. This electrotype is used as the printing plate.

Obernetter's "Lichtkupferdruck" is another process. A gelatino-bromide image is made in a film of emulsion rich in silver. This is converted into silver chloride by immersing in a solution of weak potassium dichromate acidified with hydrochloric acid. This silver chloride film is laid on to a copperplate. The chloride of silver becomes decomposed, uniting with the copper and etching it, all the details being reproduced as an intaglio. To assist the action the copperplate is connected to the positive wire of a battery, the negative wire being connected to a carbon plate placed behind the film picture. If the latter be moistened with weak salt and water the etching of the plate proceeds very rapidly.

PHOTO-ETCHING.—See **Photo-engraving.**

PHOTO FILIGRANE.—A process invented and patented by Woodbury. It is briefly a method of producing designs or photographs on paper and other similar materials by pressure, with a photographic relief.

A gelatine relief is first made with carbon tissue specially prepared for this purpose. This has a much thicker coating of gelatine. After sensitizing with potassium dichromate, it is exposed under a positive as in the Stannotype process. After transferring to the support, developing and drying, a hard gelatine relief is obtained. This is laid on to a sheet of paper, and the two passed together through a rolling press, the relief being well rolled into the paper. The result is that the paper body is pressed thinner in some parts than others, the thin parts appearing much lighter. On holding the paper up to the light, a photographic image is seen. The relief can be used a large number of times. By this process many novelties can be produced. Portraits can be pressed into visiting cards, writing paper, etc., designs of all kinds made. It being somewhat similar to the watermark in the bank-notes, it could be used for that purpose, saving considerable expense, with just as sure results, and with much less likelihood of forgery. The process has for some reason or other been abandoned commercially.

PHOTO-GALVANOGRAPHIC PROCESS.—A photo-mechanical process now no longer used, although many of the present secret processes are based upon it. Pretsch's photo-galvanographic process may thus be briefly described. A glass plate was first coated over with gelatine containing potassium dichromate or silver salt and other chemicals. When dry it was exposed under a transparency. After printing it was immersed in cold water to dissolve out the unaltered chromium salt and to cause those parts protected from the light to swell up in proportion to the protection which had been afforded by the transparency. Further, the raised portions were rough and reticulated, the reticulation being coarse or fine in proproportion as the different parts had been protected. The high lights did not, of course, swell at all, and had no grain. The plate thus produced was, of course, an exact reverse of what is required for printing. All that was then necessary was to take an electrotype cast from this relief to obtain the printing plate.

Pretsch produced plates of this description about the year 1868. The Fox-Talbot process was contemporary with Pretsch and somewhat similar.

Neither process was a commercial success, probably owing to its not being in a sufficiently perfect state to render it independent of the help of the engraver for retouching the plates.

PHOTOGASTROSCOPE.—An arrangement for photographing the inside of the stomach. Fig. 332 illustrates the apparatus. At the end is attached a small electric light which lights up the cavity. An image is transmitted through the lens tube to the camera by means of mirrors. The arrangement has also a fine tube, through which air is forced to inflate the stomach. Water is also made to circulate round the electric light.

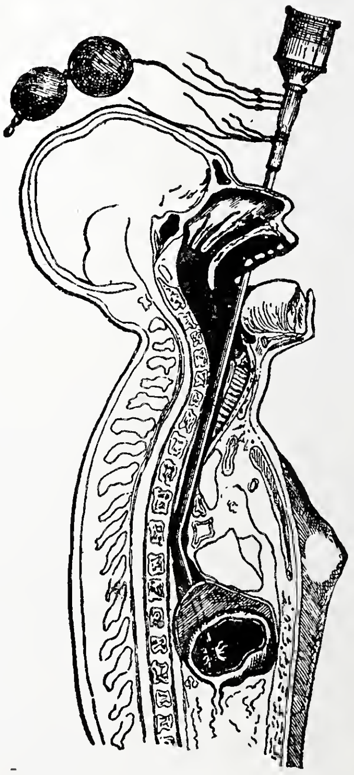


FIG. 332.

PHOTOGENE.—To produce.—The generation of a more or less continued impression or picture on the retina, and the delay in the obliteration of it.

This name was also applied by Gaudin to "any sensitive compound containing iodide of silver with excess of free nitrate."

PHOTOGENIC DRAWING.—An early photographic process described by Fox-Talbot in the year 1839. He used paper impregnated with common salt and sensitized with nitrate of silver. He also substituted potassium bromide for the common salt to get the sensitive surface. Both negatives and positives were made on this paper. Common salt was used as a fixing agent, until the superior action of sodium hyposulphite was discovered by Herschel.

PHOTOGENY.—The same as photography.

PHOTOGRAM.—Term recently adopted by many writers in place of photograph.

PHOTOGRAMMETRY.—Surveying by means of photography.

PHOTOGRAPH ENVELOPE.—An envelope intended for the reception of photographs; to keep clean and protect the surface of the paper. They are usually of some transparent material in order that the subject may be visible without removing the picture.

PHOTOGRAPHIC CHEMICALS.—The following is a list of the most important chemicals used in the various photographic operations, with English, Latin, German and French terms, compiled by C. L. Lochman:

PHOTOGRAPHIC CHEMICALS.

English.	Latin.	German.	French.
Acid Acetic	Acidum aceticum	Essigsäure	Acide acetique.
" " Glacial	Acidum aceticum glaciale	Eisessig	Vinaigre glacial.
" Chromic	Acidum chromicum	Chromsäure	Acide chromique.
" Citric	Acidum citricum	Citronensäure	Acide citrique.
" Gallic	Acidum gallicum	Gallussäure	Acide gallique.
" Hydrochloric	Acidum hydrochloricum	Salzäure	Acide chlorhydrique.
" *Muriatic*			
" Nitric	Acidum nitricum	Salpetersäure	Acide nitrique (azotique).
" Oxalic	Acidum oxalicum	Oxalsäure	Acide oxalique.
" Pyrogallic; Pyrogallol.	Acidum pyrogallicum	Pyrogallussäure; Pyrogallol.	Acide pyrogalique.
" Tartaric	Acidum tartaricum	Weinsteinsäure	Acide tartarique,
" Sulphuric	Acidum sulphuricum	Schwefelsäure	Acide sulfurique.
" Tannic; Tannin	Acidum tannicum	Gerbsäure	Acide tannique.
Alcohol, Ethyl	Alcohol	Weingeist	Alcool.
Alcohol, Wood	Alcohol methylicum	Holzgeist	Alcool methylique.
Alum, Ammonia	Aluminii et ammonii sulphas	Ammoniak-Alaun	Sulphate d'alumine et d'ammoniaque.
Alum, Chrome	Chromii et potassii sulphas	Chrom-Alaun	Alun chromi-potassique.
Alum, Potassa	Aluminii et potassii sulphas.	Kali-Alaun	Sulfate d'alumine et de potasse.
Ammonium Bichromate	Ammonii bichromicum	Doble chromsaures Ammon.	Bichromate d'ammoniaque.
Ammonium Nitrate	Ammonii nitras	Ammoniumnitrat	Azotate d'ammionaque.
Benzin'	Benzinum	Petroleumbenzin	Benzine.
Benzol	Benzolum	Benzol	Benzole.
Bromine	Bromum; Brominium	Brom	Brome.
Cadmium Bromide	Cadmii bromidum	Kadmiumbromid; Bromkadmium.	Bromure de cadmium.
Cadmium Iodide	Cadmii iodidum	Kadmiumjodid; Jodkadmium.	Iodure de cadmium.
Calcium Bromide	Calcii bromidum	Bromcalcium	Bromure de calcium.
" Carbonate	Calcii carbonas	Calciumcarbonat	Carbonate de calcium.
" Iodide	Calcii iodidum	Jodcalcium	Iodure de calcium.
Chloroform	Chloroformum	Chloroform	Chloroforme.
Collodion	Collodium	Collodion	Collodion.
Dextrin	Dextrinum	Stärkegummi	Dextrine.
Eikonogen	Eikonogen	Eikonogen	Eikonogen.
Ether (Sulphuric)	Aether (sulphuricus)	Aether; Schwefeläther	Ether sulfurique.
Gelatin	Gelatina	Gelatin	Gelatine.
Glycerin	Glycerinum	Glycerin	Glycerine.
Gold	Aurum	Gold	Or.
" Chloride.	Auri Chloridum	Goldchlorid	Chlorure d'or.
" and Sodium Chloride	Auri et sodii chloridum	Natriumgoldchlorid	Chlorure d'or et de sodium.
Gum Arabic	Gummi Arabicum	Arabisches Gummi	Gomme Arabique.
Gum Sandarac	Sandaraca	Sandarak	Sandaraque.
Gum Shellac	Ressina lacca	Lack; Gummilack	Laque.
Hydrochinon; Hydroquinon.	Hydrochinonum	Hydrochinon	Hydrochinon.

Iodine	Iodum ; Iodinium	Jod	Iode.
Iron Sulphate	Ferri sulphas	Ferrosulfat	Sulfate de fer.
Lithium Bromide	Lithii bromidum	Bromlithium	Bromure de lithium.
" Iodide	Lithii iodidum	Jodlithium	Iodure de lithium.
Magnesium Bromide	Magnesii bromidum	Brommagnesium	Bromure de magnesium.
" Iodide	Magnesii iodidum	Jodmagnesium	Iodore de magnesium.
" Sulphate	Magnesii sulphas	Magnesiumsulfat	Sulfate de magnesie.
Mercury Bichloride	Hydrargyri bichloridum	Aetzendes Quecksilberchlorid. Also "sublimat."	Deutochlorure de mercure.
Oil of Lavender	Oleum Lavandulæ	Lavendelöl	Essence de Lavand.
Oil of Turpentine	Oleum Terebinthinæ	Terpintinöl	Essence Terebinthine.
Platinum Chloride	Platini chloridum	Platinchlorid	Perchlorure de platine.
Platino-Potassium Chloride.	Platini et Potassii chloridum	Kali-Platinumchlorid	Chlorure de platinum et de potassium.
Potasso, Sulphurated ; Silver of Sulphur.	Potassa sulphurata	Schwefellieber	Sulfure de potasse.
Potassium Bichromate	Potassii bichromas	Kaliumbichromat	Bichromate de potasse.
" Bromide	Potassii Bromidum	Kaliumbromid	Bromure de potassium.
" Carbonate	Potassii carbonas	Kaliumcarbonat	Carbonate de potasse.
" Cyanide	Potassii cyanidum	Cyankalium	Cyanure de potassium.
" Ferricyanide	Potassii ferricyanidum	Ferridcyankalium	Ferricyanure de potassium.
" Ferrocyanide	Potassii ferrocyanidum	Ferrocyankalium	Ferrocyanure de potassium.
" Hydrate, Potassa.	Potassii hydras ; Potassa	Aetzkali	Potasse caustique.
" Iodide	Potassii iodidum	Jodkalium	Iodure de potassium.
" Oxalate, neutral.	Potassii oxalas	Kalium Oxalat, neutrales	Oxalate de potasse neutre.
" Sulphite	Potassii sulphis	Kaliumsulfit	Sulfite de potassium.
" Sulphocyanide	Potassii sulphocyanidum	Kalium sulfocyanat; Rhodankalium.	Sulfocyanure de potassium.
Pyroxylin ; Gun Cotton	Pyroxylinum	Collodionwolle ; Schiessbaumwolle.	Pyroxyle ; Fulmi-coton.
Silver	Argentum	Silber	Argent,
" Nitrate	Argenti nitras	Silbernitrat	Nitrate d'argent.
" Oxide	Argenti oxidum	Silber Oxyd	Oxyde d'argent.
Sodium Acetate	Sodii acetas	Natriumacetat	Acetate de soude.
" Biborate ; Borax	Sonii biboras	Natrium borat ; Borax	Borate de soude.
" Bicarbonate	Sodii bicarbonas	Natriumbicarbonat	Bicarbonate de soude.
" Bromide	Sodii bromidum	Bromnatrium	Bromure de sodium.
" Carbonate	Sodii carbonas	Natriumcarbonat	Carbonate de soude.
" Chloride	Sodii chloridum	Chlornatrium	Chlorure de sodium.
" Citrate	Sodii citras	Natriumcitrat ; Citronensaures Natron.	Citrate de soude.
" Hydrate ; Soda	Sodii hydras ; Soda	Aetznatron	Soude caustique.
" Hyposulphite or Thiosulphate.	Sodii hyposulphis	Unterschwefligsaures Natron.	Hyposulfite de soude.
" Iodide	Sodii iodidum	Jodnatrium	Iodure de sodium.
" Sulphite	Sodii sulphis	Natrium sulfit	Sulfite de soude.
" Tungstate	Sodii tungstas	Wolfraumsaures Natron	Tungstate de soude.
Starch	Amylum	Stärke ; Stärkmehl	Amidon.
Strontium Bromide	Strontii bromidum	Bromstrontium	Bromure de strontium.
" Chloride	Strontii chloridum	Chlorstrontium	Chlorure de strontium.
" Iodide	Strontii iodidum	Jodstrontium	Iodure de strontium.
Tannin, see Tannic Acid.			
Turpentine, Crude or White.	Terebinthina communis	Geweiner Terpentin	Terbenthine commune.
Uranium Bromide	Uranii bromidum	Bromuranium	Bromure d'uranium.
Uranium Nitrate	Uranii nitras	Salpetersaures Uranoxyd	Nitrate d'urane.
Water, Distilled	Aqua destillata	Destillirtes Wasser	Eau distillée.
Water of Ammonia	Aqua ammoniæ	Salmiakgeist ; Ammoniak-Flüssigkeit.	Eau d'ammoniaque.
Zinc Bromide	Zinci bromidum	Zinkbromid ; Bromzink	Bromure de zinc.
Zinc Chloride	Zinci chloridum	Chlorzink	Chlorure de zinc.
Zinc Iodide	Zinci iodidum	Zinkjodid ; Jodzink	Iodure de zinc.

Under *formula* will be found another list giving the formulæ and molecular weights

It is very essential in most photographic processes that the chemicals be perfectly free from impurities, as by the presence of small quantities of foreign matter the success of a process is often ruined entirely. The following list* of the impurities occasionally found in the various chemicals, and the means of testing same, will be found useful :

SUBSTANCE.	IMPURITIES PRSSIBLY PRESENT.	TESTS.
Ammonia	Carbonic acid	Renders lime-water milky.
	Dissolved solid matter	Residue left on evaporalion.
	Chlorides	After acidulating with nitric acid, it gives a precipitate with silver nitrate, which, after washing, is readily soluble in ammonia, and re-precipitated by nitric acid.
	Sulphates	After acidulating with nitric acid, it gives a precipitate with barium nitrate.
	Lime	A white precipitate with oxalate of ammonium.
	Lead is often present, derived from the action upon flint glass bottles.	Black precipitate with sulphuretted hydrogen.

SUBSTANCE.	IMPURITIES POSSIBLY PRESENT.	TESTS.
Nitric Acid	Traces of sulphuric acid	After dilution it gives a precipitate with barium nitrate.
	Chlorides	After dilution it gives a precipitate with silver nitrate
	Peroxide of nitrogen	The acid is yellow.
	Iodine may be present if the acid be prepared from sodium nitrate.	After dilution and cooling it gives a blue color with starch paste or mucilage.
Hydrochloric Acid	Free chloride	Liberates iodine from solution of potassium iodide. See also chlorides, nitric acid.
	Sulphuric Acid	As above for nitric acid.
	Perchloride of iron	Yellow color. Brown precipitate with ammonia added till it smells slightly.
Hydrochloric Acid	Arsenic	Marsh's test.
	Some yellow samples contain no iron, but an organic salt, and give an alkaline ash on ignition of the residue after evaporation.	Reinsch's test; a small piece of copper foil becomes coated on boiling in dilute acid.
Sulphuric Acid	Bisulphate of potassium	Residue on evaporation.
	Sulphate of lead	Milkiness on dilution.
		May be completely freed from lead by diluting with three or four times as much water, and allowing to settle.
	When sold as pure, it invariably contains a trace of iron. Common acid is also liable to contain arsenic, selenium, thallium, and many other substances.	No easy test can be given, as the substances are so numerous; some of them volatile, and most require separation from the acid before detection.
	Organic matter, as a piece of straw in a carboy of acid	Gives a brown color to the acid.
Acetic Acid	Water	Does not solidify when cooled to 17° C. (53° F.)
	Sulphurous and hydrochloric acids	White precipitate with silver nitrate.
	Aldehyde, or volatile tarry matter.	Blackens in the light after adding silver nitrate.
	Organic sulphuric acid	Smell of garlic.
Citric Acid	Tartaric acid	Strong solution of potassium acetate added to a strong solution of the acid will deposite white crystalline bitartrate.
Pyrogallic Acid	Metagallic acid	Black residue insoluble in water.
Silver Nitrate	Free nitric acid	Reddens litmus paper (neutral silver nitrate does not affect litmus).
Potassium Carbonate	Chlorides and sulphates	Same as for ammonia.
Potassium Iodide	Potassium carbonate	A strong solution is alkaline to test paper.
	Sulphates and chlorides	Same as for ammonia.
	Potassium iodate	A pretty strong solution becomes yellow from liberation of iodine on addition of dilute sulphuric acid. or, better, a strong solution of citric acid.

TABLE OF EQUIVALENT QUANTITIES OF SOME HALOIDS USED IN PHOTOGRAPHY.

CALCULATED FOR THE ANHYDROUS AND DRY SALTS.

By A. B. AUBERT, Professor of Chemistry, Maine State College, Orono, Me.

† EQUIVALENT QUANTITIES OF VARIOUS CHLORIDES USED IN PHOTOGRAPHY.

Sodium Chloride.	Potassium Chloride.	Ammonium Chloride.	Lithium Chloride.	Cadmium Chloride.
1	1.275	0.914	0.726	1.564
0.784	1	0.717	0.569	1.226
1.093	1.394	1	0.794	1.710
1.376	1.755	1.258	1	2.152
0.639	0.818	0.584	0.464	1

† EQUIVALENT QUANTITIES OF VARIOUS BROMIDES USED IN PHOTOGRAPHY.

Bromine.	Ammonium Bromide.	Potassium Bromide.	Sodium Bromide.	Cadmium Bromide + 4 Equi. Water.	Zinc Bromide.
1	1.225	1.488	1.287	2.150	1.406
0.816	1	1.214	1.055	1.754	1.147
0.672	0.823	1	0.865	1.445	0.945
0.777	0.952	1 156	1	1.671	1.092
0.465	0.570	0.692	0.599	1	0.654
0.711	0.871	1.058	0.915	1.529	1

---

* Compiled by G. M. Jones for the "American Annual of Photography."

† Translated and partly recalculated from the "Agenda du Chimiste."

† Equivalent Quantities of Various Iodides Used in Photography.

Iodine.	Ammonium Iodide.	Potassium Iodide.	Sodium Iodide.	Cadmium Iodide.	Zinc Iodide.
1	1.142	1.307	1.181	1.441	1.255
0.876	1	1.145	1.035	1.262	1.099
0.765	0.874	1	0.903	1.102	0.960
0.847	0.967	1.107	1	1.220	1.063
0.694	0.793	0.907	0.820	1	0.871
0.797	0.910	1.042	0.941	1.148	1

† Equivalent Quantities of Various Silver Salts Used in Photography.

Silver (Metallic).	Nitrate.	Chloride.	Bromide.	Iodide.
1	1.574	1.328	1.741	2.176
0.6353	1	0.844	1.106	1.382
0.7523	1.184	1	1.310	1.638
0.5744	0.904	0.763	1	1.250
0.4595	0.723	0.610	0.800	1

† Equivalent Quantities of Various Gold Salts Used in Photography.

Gold (Metallic).	Chloride.	Double Chloride of Gold and Potassium.	Double Chloride of Gold and Sodium.
1	1.542	2.1048	2.0229
0.6485	1	1.3645	1.3119
0.4751	0.7326	1	0.9611
0.4943	0.7623	1.0405	1

PHOTOGRAPHIC CHEMISTRY.—The number of chemical changes that take place in photographic operations is so great that it will only be possible to mention the most important. The process that is now almost universally adopted is the gelatino-bromide dry plate process. This has taken the place of a large number of processes and improvements, starting with the Daguerreotype process. In this method of obtaining photographic images a sensitive plate was prepared by exposing a silvered tablet to the action of vapor of iodine, which combines with the metallic silver to form silver iodide, thus:

$$Ag_2 + I_2 = 2AgI.$$

Subsequently bromine vapor was used with iodine. On exposing the plate thus prepared in the camera a latent image was formed, which was made to appear by the vapor of mercury. Sodium hyposulphite was afterwards discovered as a fixing agent.

After the Daguerreotype came the colotype or Talbotype process, named after the inventor, Fox-Talbot. In this paper was used as the support for the image. It was prepared by first floating on a solution of silver iodide, and then washing slightly. When required for use this paper was excited with gallic acid and aceto-nitrate of silver brushed over it. It was then exposed in the camera, and afterwards developed with the same substances.

Then came the collodion process of Scott Archer, still employed for special work, as in photo-mechanical printing. In this process glass plates were first coated with collodion (a solution of gun-cotton dissolved in ether and alcohol) containing an iodide salt,* and then sensitized by immersion in a bath containing a silver nitrate solution. The iodide combining with the silver formed silver iodide, thus:

$$AgNO_3 + CdI = AgI + CdNO_3.$$

The sensitized plates, after exposure to the image in the camera, were developed with pyrogallic acid with either acetic or citric acids. The negatives thus obtained were fixed with potassium cyanide or sodium hypo-sulphite.

We now come to the modern *dry* plate process, so called to distinguish it from the collodion process, in which the plates were exposed in the *wet* state. The material which forms the sensitive surface of the plate is silver bromide, in some cases mixed with chloride and iodide, and held in position by a gelatine.

Silver bromide is a heavy, almost insoluble, white precipitate, obtained by adding a solution of potassium or ammonium bromide to one of silver nitrate. The white flakes of silver bromide thus formed fall to the bottom of the vessel, and in this form the compound is practically useless for photographic purposes. If, however, a fluid of a viscous nature is used, the silver bromide will not fall to the bottom, but remain in suspension, and in this form is termed an emulsion, which can be used for coating plates or paper. The usual method is to dissolve a quantity of gelatine in warm water, and mix with it the ammonium bromide. The silver nitrate is then

---

* Cadmium iodide was usually employed.

† Translated and partly recalculated from the "Agenda du Chimiste."

THE PHOTOGRAPHIC TIMES.

AN ILLUSTRATED MONTHLY MAGAZINE DEVOTED TO THE ART, SCIENCE AND ADVANCEMENT OF PHOTOGRAPHY.

Issued on the fifteenth of each month.

EDITED BY WALTER E. WOODBURY, F. R. P. S.

SUBSCRIPTION RATES.

For one year,	$4 00	Three months' trial,	$1 00
For six months,	2 00	Single copy,	35

On Foreign Subscriptions, $1.00 is added to pay postage.

Remit by Express Money Order, Draft, P. O. Order, or Registered Letter.

Subscriptions to THE PHOTOGRAPHIC TIMES received by all dealers in photographic materials in this and foreign countries, also by The American News Co. and all its branches.

ADVERTISING RATES WILL BE SENT ON APPLICATION.

Copy for advertisements must be received at office one week in advance of the day of publication. Advertisers receive a copy of the journal free, to certify the correctness of the insertion.

All literary contributions, correspondence, "Queries," etc., should be addressed to THE EDITOR; all advertising matter to the Publishers.

THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION,
60 and 62 East 11th Street, New York.

Businesses For Sale.

Advertisements will be inserted in this column at the rate of 25 cents per line of ten words. Display lines will be charged double. No Advertisement will be inserted for less than one dollar. Cash must in every case accompany copy, which should reach us not later than the tenth of each month.

FOR SALE.—One second-hand 20 x 24 Scovill camera, double swing, focus lever, extension bed with curtain slide, bonanza holder. List $110. One 20 x 24 Beck lens. List $200. All in good condition and will sell at a bargain. Address L. M. Prince & Bro., 108 West 4th Street, Cincinnati, O.

FOR SALE.—One of the finest galleries in the country, in a Western city; handsomely furnished; all conveniences; world-wide reputation; fitted with Dallmeyer lenses to 18 x 22; 23,000 negatives; business $350 per month; $6 and $8 dozen cabinets; must sell. For information address G. R., care of PHOTOGRAPHIC TIMES.

FOR SALE.—At a bargain, one No. 5 Kodak, adapted to plates and films. Address B. M. Yates, McCredie, Mo.

FOR SALE.—The leading Studio in a Massachusetts city, 15,000, and as many more to draw from. Duplicates in 1896. Average, $40.27 per month. Rent, $13.00. Cabinets, $3.00 and $4.00. If desired, half cash, and balance, easy payments. Address C. L. Fremont, Marlboro, Mass. Box 148.

FOR SALE.—$1000 cash will buy a fine Gallery in the city of Spokane, Washington, 3500 inhabitants. Instruments from cabinet to 18 x 22. Good reasons for selling. Address "B," care Zimmerman Bros., St. Paul, Minn.

FOR SALE—Only gallery in town of 5,000. Best location in the State. Fully equipped for work to 11 x 14. Write quick if you want it.
H. F. MORLEY, Rock Hill, S. C.

Lantern Slides from drawings, photographs, or negatives. Best work at reasonable rates. Scovill & Adams Co. of N. Y.

Gallery for sale; mining town; 8,000 population; no opposition; good business year round; no winter; fine climate. For particulars write, W. O. Amsden, Grass Valley, Cal.

Employment.

ADVERTISEMENTS OF OPERATORS SEEKING SITUATIONS WILL BE INSERTED FREE OF CHARGE.

Employment Wanted.

Wanted by an up-to-date photographer (competent to take charge of a studio) a position in a thriving town, East or West. The highest reference as to character and ability will be given. Address A. M. Bertels, cor. Butler and Canal Street, Wilkesbarre, Pa.

Wanted, by a first-class operator and general skylight man of long experience. Understands all branches. Good reference given and samples sent. J. S. Reitmeyer, 25 Hudson Avenue, Green Island, Troy, N. Y.

A capable operator wishing to make a change will be open for engagement Oct. 1. Artistic in posing and lighting. Practical in carbon printing. Single and double transfer. Have had experience as manager of well-known studios—willing to make himself generally useful, or would buy interest in good paying studio. Reference given and required. Address "Carbon," care PHOTOGRAPHIC TIMES, 62 East 11th Street.

A printer of wide practical experience with the leaders is now ready to engage with a first-class man. Would not object to going out of town. References. J. Chauncey Davis, 1581 Atlantic Ave., Brooklyn, N. Y.

A first-class operator and retoucher wants a position. W. Hoesten, 349 Ninth Avenue, N. Y. City.

Situation wanted by first-class printer and toner (all processes), retoucher as well, of 18 years experience first-class reference. C. E. Pearsall, 101 Congress St., Saratoga Springs, N. Y.

Situation wanted as operator and printer. Carbon and bromide work. Address "Photographer," Lock box 85, Palmyra, N. Y.

Position wanted as operator in good gallery, or can take charge. A1 references and samples on application. Address F. F. McLean, 55 W. Church St., Washington, N. J.

Photographers Attention—A strictly first-class printer of fourteen years' experience, one who can doctor negatives in printing; can handle all papers, is open for an engagement. Address "Artistic," Saratoga Spa, N. Y.

A first-class operator, can pose and light well. Also first-class retoucher. Best references. Molina, 7 West 106 Street, City.

Note.—Some interesting reading matter will be found on the following pages.

The Permanency of "R. M. & W." Products is beyond question.

Not Substitutes—

Improvements.

The Century Dictionary defines Substitute as "A thing serving the purpose of another"; Improvement, as "A betterment; that by which the value or excellence of a thing is enhanced."

Judge "R. M. & W." papers by these definitions. They are not mere substitutes for the papers you have been using, but improvements upon them—possessing distinctly new qualities and advantages. And the more artistic your ideas, the more exacting the requirements of your patrons, the more plainly is the use of "R. M. & W." papers indicated.

Vera Matte prints are the closest imitation of carbon ever produced; and what Vera Matte is to carbon, that are Victor and Vera to albumen.

Samples by return mail.

THE REICHENBACH, MOREY & WILL CO.,

ROCHESTER, N. Y.

Makers of { Vera and Vera Matte—Pure Collodion Papers.
Victor, Victor Matte and Victor Special—Pure Gelatine Papers.

IN ADDITION TO
French Satin Jr.
THE STANDARD BLUE PRINT PAPER

We are Manufacturing a line of

Photographic Specialties

The same careful supervision which controls the manufacture of our Blue Print Paper will be extended to these new products, of which we have ready

MILLEN'S

- NORMAL PHOTOGRAPHIC DEVELOPER
- CHROMIUM FIXING SALT
- STANDARD WHITE PASTE
- HARDENING SOLUTION
- HYDROQUINONE (*Chemically Pure*)

Send for descriptive circulars of any of the above articles

J. C. MILLEN, M.D.,
Manufacturing Chemist,
DENVER, COLORADO: *No. 1731 Welton Street.* . ˙ . PHILADELPHIA, PA.: *Nos. 919 & 921 Arch Street.*
UNITED STATES OF AMERICA.

FOR SALE.—Three Photo Gelatine Power Presses (Faber-Schleicher), formerly belonging to the F. Gutekunst Co. Will be set up in running order and instruction given. The Albertype Co., 15 Laight Street, New York.

H. B. PUTERBAUGH, PHOTOGRAPHER AND PROCESS ENGRAVER.

JOHN CARBUTT, Esq., Wayne Junction, Pa.

Dear Sir: Sample of your "New Process Plate" at hand and tested with the MOST PLEASING RESULTS. I send herewith a small order for Strippers, and if I have as good success as I had with my first trial, I shall discard the wet plate process FOREVER, for I am disgusted with it.

Very respectfully,
(Signed) H. B. PUTERBAUGH.

RETOUCHING FOR THE TRADE—First class work at moderate prices. Address Miss ALICE WINSLOW, 1,129 N. Main street, Brockton, Mass.

LANTERN SLIDES.—If you require good ones from your negatives send to

H. H. WILLIAMS, Simeon, Va.

MORAN'S BARGAIN LIST No. 47,
NOW READY.

If you want anything in the Photographic line, it will pay you to send for it.

FREE USE OF DARK ROOM.

R. H. MORAN, 22 East 16th St., New York.
One Door West of Union Square.

SPECIAL NOTICE.

BACKGROUNDS
FOR CARBON AND PLATINUM EFFECTS.

W. F. ASHE, Scenic Artist,
76 East 9th Street, - - New York City.

Have you anything ... to sell ...?

The American Annual of Photography for 1898

Reaches 20,000 Amateur and Professional Photographers.

Address, for Advertising Rates, to

Manager The American Annual of Photography,
60 & 62 EAST 11TH ST., N. Y.

THE ALBERTYPE COMPANY
PHOTO-GELATINE PRINTERS
15 LAIGHT ST., NEW YORK.
VIEWS MADE INTO SOUVENIRS
at short notice, from photographs or negatives.
SEND FOR SAMPLES AND EDITION PRICES.

CHAS. R. STEVENS, Pres't and Treas.
GEO. P. MACKIN, Vice-Pres't and Sec'y.

CHICAGO PHOTO STOCK CO.,
Dealers in
Standard Photographic Apparatus and Supplies,
38 E. Randolph St., Chicago, Ill.

Use "Non-Cockle" Mounting Paste.

PHOTOGRAPHIC SUPPLIES.

Order Your Photo Goods

OF THE

NEW STOCK HOUSE

Meyer Brothers Drug Co.

Saint Louis.

WIDE AWAKE

MANUFACTURERS AND DEALERS

Will be represented in

The American Annual of Photography for 1898.

NOW IN PREPARATION.

Address:

Manager The American Annual of Photography,

60 and 62 East 11th St., N. Y.

A GREAT CONVENIENCE IN DEVELOPING DRY PLATES.

Pelletone

PYROGALLIC

ACID TABLETS,

Put up in bottles, each containing 100 2-grain (*exactly* 2 grains) tablets of

SCHERING'S

Unrivaled Pyrogallic Acid

—o—

Price per Bottle, reduced to 40 Cents.

For Sale by all Dealers, and

THE SCOVILL & ADAMS CO.

KING OF

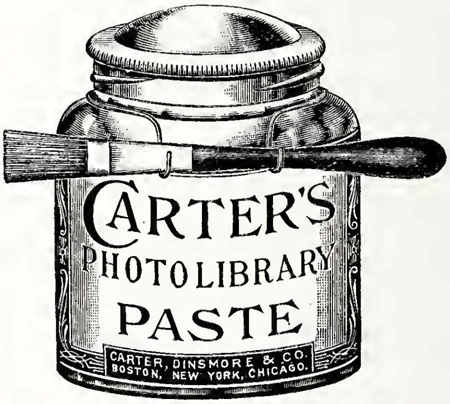
FLASH LIGHT POWDERS.

LUXO

PATENTED.

FOR SALE BY ALL DEALERS

W. P. BUCHANAN. PHILADELPHIA.



No. 153, 7 oz. Jar.

The latest advanced chemical research in the department of adhesives is embodied in

Carter's Photo-library Paste,

which is specially adapted to delicate and important Photographic and Library work, such as Mounting, Photographs and Engravings, Labeling Books and Magazines, Attaching Clippings to Scrap-books, etc. The Paste is smooth, uniform, and powerfully adhesive. It does not cockle paper or injure in any way objects to which it is applied. It is delightfully perfumed, put up in attractive and convenient packages, and always ready for use.

Send for Sample and Descriptive Circular.

CARTER INK CO.,

Boston, New York, Chicago.

Reifschneider's Eclipse Albums are the Best.

MONSTER BARGAIN LIST = = = No. 9

32 Pages of Bargains in

CAMERAS,
LENSES,
BURNISHERS,
STANDS,
BACKGROUNDS,
Etc., Etc.

You cannot afford to miss it.

Will be mailed about October 15, 1897.

RALPH J. GOLSEN,
146 State St., CHICAGO.

W. HEUERMANN,
IMPORTER OF
TRAPP & MUNCH'S
T. M. BRAND.
ALBUMEN PAPER, SALTED PAPER,
No. 23 CEDAR STREET, New York.

THE IDEAL TELEMETER
(PATENT APPLIED FOR)
A Distance-Measuring Instrument for Hand Camera Workers.

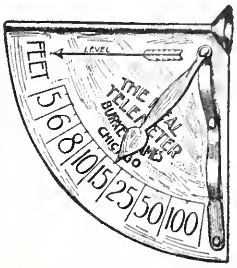
Price 50 Cents.

With this instrument you can quickly and accurately measure by sight the distance between the camera and the object to be photographed.

It is beautifully made and nickel-plated, and can be carried in the pocket.

For sale by Photo. Supply Dealers.

BURKE & JAMES, Manufacturers,
89 Madison Street, CHICAGO, ILLINOIS.



Apparatus for making : : : :

FILMS

Or PICTURE RIBBONS, for moving-picture machines.

Perforators, Standard Gauge,	$100
Cameras, Hand, Spring, and Electric,	$75 and $150
Printers, Gas and Electric,	$25
Developing Trays,	$25 and $100
Complete plant,	$150

LIBERAL DISCOUNT TO TRADE.

C. FRANCIS JENKINS, 1325 F Street, N. W., Washington, D. C.

ALUMINUM
SUN FLASH POWDER
(PATENTED)
WILLIAMS, BROWN & EARLE
PHOTOGRAPHIC SPECIALTIES
PHILADELPHIA
FOR SALE BY ALL DEALERS

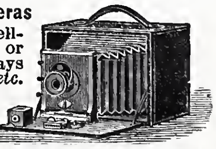
ASK TO SEE THE NEW
W. B. & E. ART ALBUMS
NO PASTING REQUIRED
WILLIAMS, BROWN & EARLE
PHOTOGRAPHIC SPECIALTIES
PHILADELPHIA
SOLD BY ALL DEALERS

THE AMERICAN PHOTOGRAPHIC PAPER CO.,
MANUFACTURERS OF
UNPREPARED
SPECIALTIES;
Photographic Papers

Raw Paper for Solar Printing, Platinotype, Bromide, Salting, Baryta Coating, rough or smooth surface, in rolls or sheets. Also high grade Drawing Paper for Architects, Buff and White, in rolls or sheets.

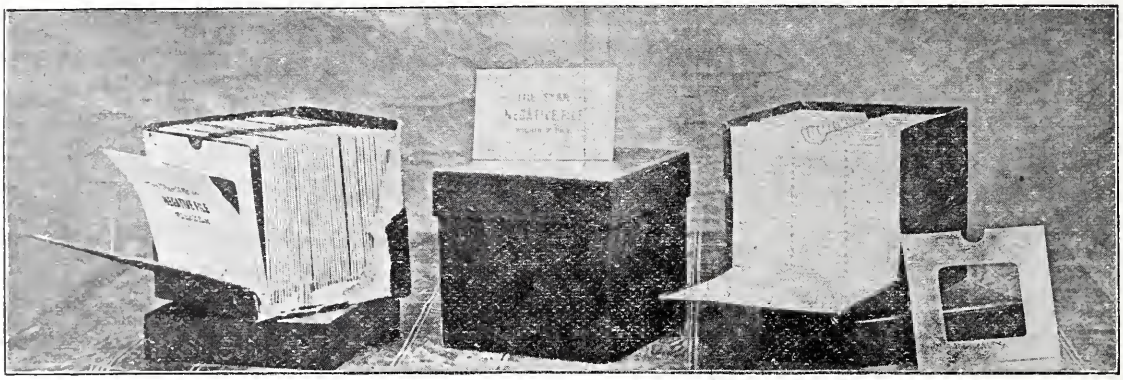
MANUFACTURED AT MILLS OF
HURLBUT PAPER MANUFACTURING CO., SOUTH LEE, MASS, U.S.A
OFFICES:
2304 Washington St., Boston, Mass., U.S.A.

N. Y. CAMERA EXCHANGE
60% Saved on all makes of Cameras
Headquarters for Buying, Selling, and Exchanging Cameras or Lenses. Large assortment always on hand. *Developing, printing, etc.* Photo supplies of every description at *lowest prices.* ☞ *Send 2c. stamp for bargain list.* Address
N. Y. CAMERA EXCHANGE, 41 Fulton St., NEW YORK.



Are You Using Hammer Plates?

PRESERVE YOUR NEGATIVES.



THE STAR NEGATIVE FILE

is of great convenience to the photographer. It holds 50 negatives (or Lantern Slides), between pasteboard mats which can be numbered for quick reference. It is also furnished with an index, with numbers corresponding to the numbers on the mats. They are made in three sizes.

Price for Lantern Slide size, 50 cents.

4 x 5 size, 60 cents. ∴∴ *5 x 7 size, 85 cents.*

For sale by all the trade, and

THE SCOVILL & ADAMS COMPANY OF NEW YORK,
TRADE AGENTS,
60 & 62 EAST ELEVENTH ST., NEW YORK CITY.

THE ALBERTYPE COMPANY,

15 LAIGHT STREET, NEW YORK,

Near Canal Street, West.

Photogelatine Printing.

THE LARGEST PLANT IN AMERICA.

Specialty : : : :

Souvenirs to order of Views, Portraits, Etc.

(WRITE FOR SAMPLES AND PRICES).

Half-Tone Plates to Order.

The Brilliant Developer.

This new developer surpasses all others in **covering power** and **cheapness**, it keeps for weeks after use, and a surprising number of plates can be developed in the same solution before it is exhausted. With equal exposures and equal time of development it will give as an average **three times** more **covering** than any other developer. It is a liquid developer and ready for use after being mixed with an equal quantity of a 10 per cent. solution of Carbonate of Potash. It is very clean and discolors very little even when kept some time after use.

After extensive tests, comparing it with Pyro, Ferro Oxalate, Hydrochinone, Metol, Eikonogen, Amidol, etc., etc., it has been ascertained, that in using the Brilliant Developer as an average only **one third** of the time of **exposure** is necessary, compared with the exposure required when developing with the other developers, which is an enormous advantage, especially during dull weather. Thus much money, time, and work can be saved on plates, which otherwise would have been **lost** by **under exposure** or the object having **moved.**

The price is very moderate and lower than of the most developers at present in use, as the same solution can be used over and over again by adding from time to time some fresh Brilliant Developer.

The success this new developer is having in Europe is simply marvellous, especially with professional Photographers, who are as a rule, so reluctant to try new materials. It has obtained a prize at the **Berlin Exhibition for Photography,** and scores of testimonials are arriving every week.

FORMULA.

Dissolve 1 oz. of Pure Carbonate of Potash in 10 ozs. of water.
Mix 1 oz. of Brilliant Developer with 1 oz. of the above Potash solution.

If very soft negatives are required the proportion of potash solution may be increased.

FOR DEVELOPMENT OF BROMIDE PAPER,

for which the Brilliant Developer is also particularly suitable the following proportions are recommended:

½ oz. of Brilliant Developer.
½ " " Potash Solution.
1 " " Water.

This will develop a great number of Prints. For softer results more water must be added.

* * *

THE BARMEN DRY PLATES MFY.

TRADE AGENTS:
THE SCOVILL & ADAMS CO.
OF NEW YORK,
60 and 62 East Eleventh Street, NEW YORK.

BRUNE & HÖFINGHOFF,
Barmen, Germany.

Use the **Hammer** = =

Dry Plates

ABSOLUTELY

Uniform and Clean.

Incomparable

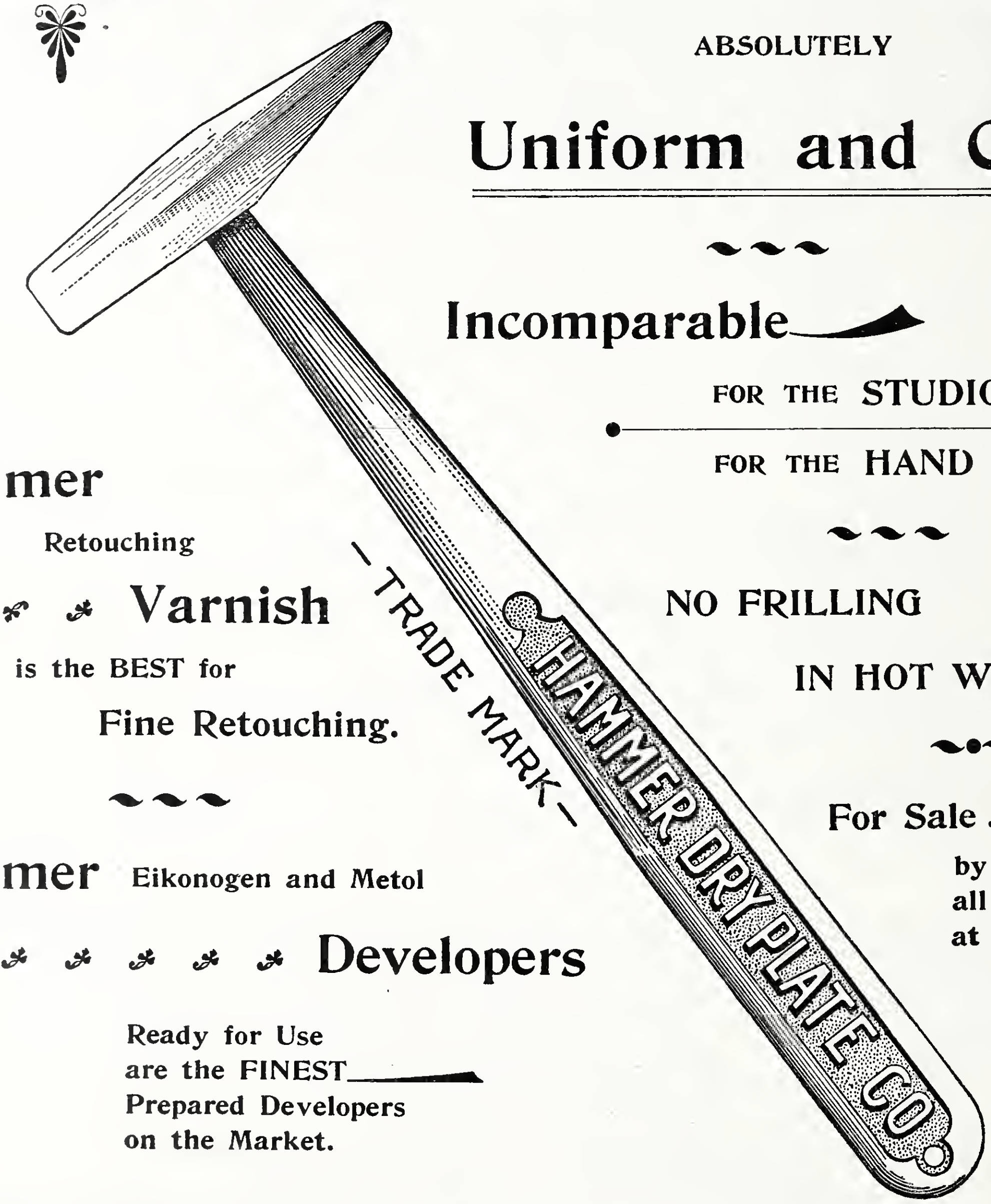
FOR THE STUDIO,

FOR THE HAND CAMERA.

NO FRILLING

IN HOT WEATHER.

For Sale ....
by
all Dealers
at
Popular Prices.



Hammer
Retouching
Varnish
is the BEST for
Fine Retouching.

Hammer Eikonogen and Metol
Developers
Ready for Use
are the FINEST
Prepared Developers
on the Market.

Send for Hammer's "Little Book" a short talk on negative making, mailed free to any address.

MANUFACTURED BY

Hammer Dry Plate Co.,
ST. LOUIS, MO.

THE SCOVILL & ADAMS CO. OF N. Y., EASTERN TRADE AGENTS.

MINOTT M. GOVAN,
DEALER IN PHOTOGRAPHIC SUPPLIES,
No. 5 Clinton Place, New York.
(Three doors from Broadway.)

FULLY ILLUSTRATED Catalogue and Price List mailed on application. Lenses and Outfits a specialty.

DIETZ RUBY LAMP

For Dark-Room Use.

New Construction
Don't Leak Light.
$1\frac{1}{2}$x3x$6\frac{1}{2}$ ins.
NO SMOKE.

Sold by Dealers.
We send you one, prepaid, for 75 CENTS.
Circular free.

R. E. DIETZ CO., N. Y.

"Modern and Progressive."

STEPHEN B. BUTTS.
JOHN F. ADAMS.

BUTTS & ADAMS,

TRADE B & A MARK

Photographic Supplies,

457 and 459 Washington Street,
BUFFALO, N. Y.

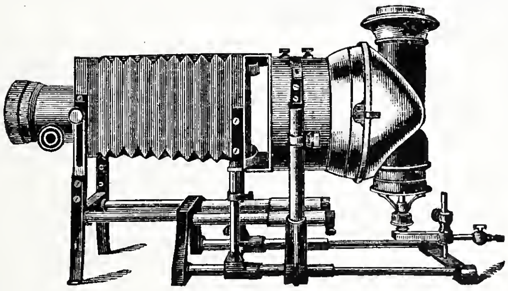
Something New!!

P. P. P. ENLARGEMENTS FOR PHOTOGRAPHERS.

SEND FOR PRICE LIST NOW.

Headquarters for Portraits in Crayon, Water Color, India Ink, and Pastel.

STONE BROS., SUCCESSORS TO N. L. STONE & SON,
56, 58, & 60 Market St., Pottsdam, N. Y.



Criterion Projection Lantern

WITH WELSBACH GAS BURNER.

Oil, Lime, Welsbach Gas, Incandescent Electric or Arc Electric Light may be used interchangeably with our make of

Magic Lanterns and Stereopticons.

The view front of lantern is interchangeable with various

SCIENTIFIC ATTACHMENTS.

Send for Illustrated Catalogue.

"How to Make and Color Lantern Slides."

BY D. L. ELMENDORF.

A new book of instructions; the most complete and comprehensive work on the subject published.

PRICE (Postpaid), - ONE DOLLAR.

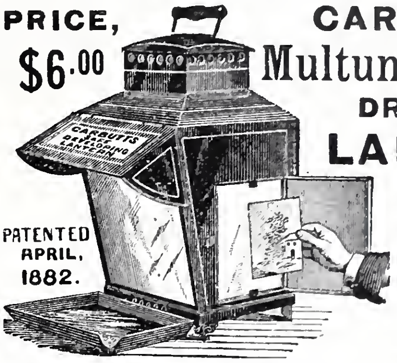
J. B. COLT & CO., 115-117 Nassau St., New York.
UPTOWN BRANCH, 59 FIFTH AVENUE.

A Rare Opportunity.

FOR SALE. A well established photo-engraving business: one of the leading houses in New York City. Present owners retiring from business. Responsible parties only need apply, in the first instance, to the Editor of this magazine.

PRICE, $6.00

CARBUTT'S Multum-in-Parvo DRY PLATE LANTERN.



PATENTED APRIL, 1882.

Lantern arranged for developing, and, after fixing, examining negatives and positives by opal light.

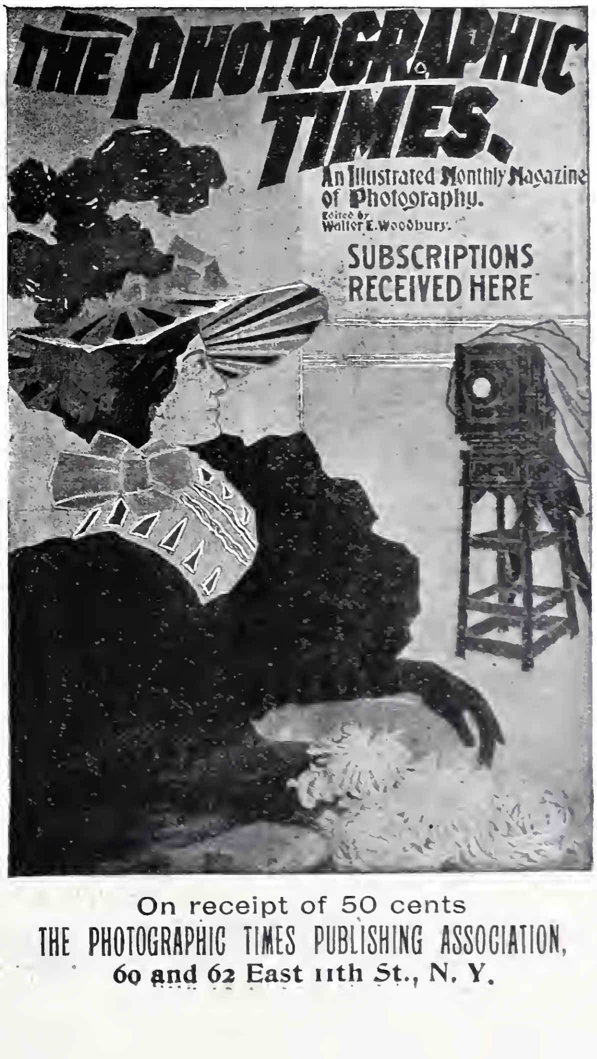
The **Best** and **Cheapest** for all Dark-Room Work.

Manufactured by

JOHN CARBUTT
Wayne Junction,
Philadelphia.

TO POSTER COLLECTORS.

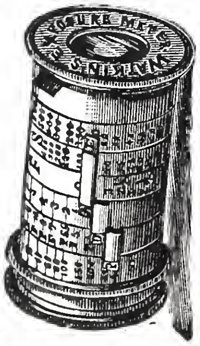
Copies of this poster Size 2 x 3 feet will be sent free


THE PHOTOGRAPHIC TIMES.
An Illustrated Monthly Magazine of Photography.
Edited by Walter E. Woodbury.
SUBSCRIPTIONS RECEIVED HERE

On receipt of 50 cents
THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION,
60 and 62 East 11th St., N. Y.

AVOID FAILURES IN MAKING NEGATIVES BY USING THE **WATKINS EXPOSURE METERS.**

THE NEW STANDARD (1895.) $5.00.



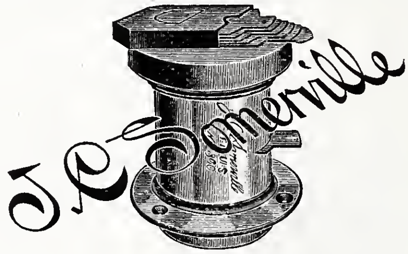
SIMPLER than the old standard, having one less pointer. Provided with the subject and enlarging scales, which do not obtrude themselves when not wanted. The only instrument made which is *absolutely complete* for all problems, especially copying, enlarging and contact printing without reference to tables. It supersedes the old enlarging pattern at a smaller cost. The best all round instrument, as for ordinary work it is quite as simple in use as the Watch or Junior patterns, though not made so light or convenient in shape; quite a feather-weight when made in aluminum. Provided with a pendulum, which is invaluable for timing the actinometer and camera exposures. Exposures under one second are now marked in vulgar fractions, on a distinct part of the scale to the seconds scale.

INSTRUCTIONS (for all ordinary subjects).—*Set pointer P to plate speed, D to the diaphragm, A to the light value, and E will indicate the exposure.*

For Sale by THE SCOVILL & ADAMS CO. OF N. Y., 60 & 62 E. 11th St.

---

411 and 413 Washington Avenue,

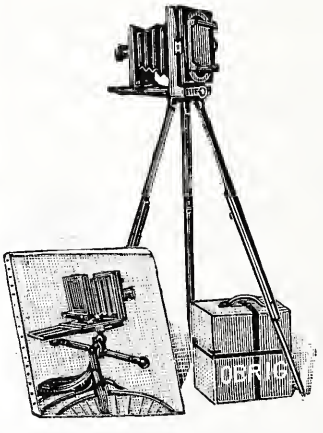


ST. LOUIS, MO.

Send for Our Lens Pamphlet and Bargain List.

OUR FACILITIES

Were NEVER BETTER



For turning out good printing than they are at present. We are known for our good, even and careful work in this respect. With the word "**Printing**" we mean to cover not only **Albumen** and **Aristo** contact work, but **Platinotype** and **Blue Prints** as well. Bromide Enlargements are a specialty with us, and developing both plates and films receive our careful attention and are done at factory prices. Our little "**Booklet of Good Things**" contains prices for all this work, and can be had with our new **Bargain List** (just out) for a one cent stamp.

O. C. Co.'s well known "Special" Blue Paper, 25 cents per yard (cut to any size and mailed free).

OBRIC CAMERA CO.,
165-167 BROADWAY, NEW YORK,
NEAR CORTLANDT STREET.
TELEPHONE No. 4704 CORTLANDT ST.

We have a new KODAK and KODET booklet ready for distribution.

YOU WILL LAUGH

WHEN YOU SEE THE HUMOROUS ILLUSTRATIONS IN

Photographic Amusements,

By WALTER E. WOODBURY (**Editor Photographic Times.**)

BUT You can find out how to make them too. All sorts of the grotesque effects with the camera, including spirit photographs, doubles, caricature portraits, etc., etc. *Over 100 Illustrations.*

Price, in paper covers, $1.00; cloth, $1.50.

For sale by all Photographic Dealers, or by

The Scovill & Adams Company of New York,
NEW YORK CITY.

STEINBACH & CO., MALMEDY, GERMANY

Manufacturers of

Photographic Papers

For Solar and Bromide Enlargements, Salting, Albumenizing, and Baryta Coating;

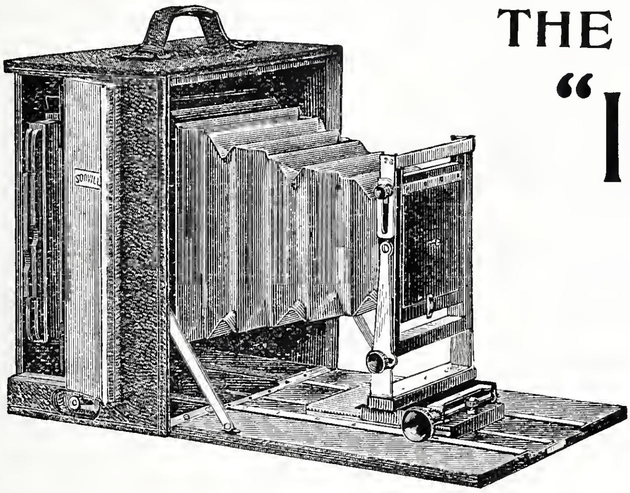
UNEXCELLED FOR BLACK AND BLUE PRINTING,

BARYTA PAPERS, GLOSSY AND MATT SURFACE.

SEND FOR SAMPLES AND ESTIMATES.

NEW YORK OFFICE:
621 BROADWAY.

PAUL PUTTMANN,
Sole Agent for the U. S. and Canada.



THE IMPROVED "IRVING-CLAY" CAMERA

THIS "fin de siècle" Camera, as it has been called, marks the highest attainment in camera manufacture *at the end of this century.* It is made at the works of the well-known American Optical Company, which in itself is a guarantee of perfection in durability of construction and fineness of finish.

A preliminary camera of this name was introduced some weeks ago, and the entire stock was quickly sold. The **Improved Irving-Clay** fully justifies its name, as it is a much improved form of the first camera of this class introduced. It contains two double holders instead of one, and the entire construction of the camera has been improved, with many useful and valuable features added.

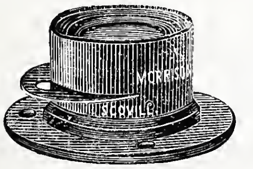
The Improved Irving-Clay combines the best features of the well-known "Henry Clay" and "Irving" Cameras, as its name indicates, and is the only hand and tripod folding camera with reversible self-adjusting spring back, and other features characteristic of these two cameras. It is made of thin spruce, highly polished, and is therefore extremely light and portable. It is covered with the best grade of leather, and possesses all the movements—swing back, front focus, shifting front and movable front boards—and conveniences which an "up-to-date" camera should have.

PRICE:	6½ x 8½, with *two* Double Irving-Clay Plate Holders,	**$45.00**
	8 x 10, " " " " " "	**50.00**

The Scovill & Adams Company of New York,

60 and 62 EAST 11th STREET, NEW YORK.

MORRISON WIDE-ANGLE VIEW LENSES.



These lenses are absolutely rectilinear; they embrace an angle of 90 degrees, and are the most rapid *wide-angle* lenses made.

No.	Diameter of Lens.	Size of Plate.	Equivalent Focus.		Price.	
0	1 inch	3¼x4¼ inch	2¼ inch	each,	$20.00	These 5 sizes will fit into 1 flange.
2	1 "	4 x 5 "	3½ "	"	25.00	
3	1 "	4¼x 6½ "	4¼ "	"	25.00	
4	1 "	5 x 8 "	5¼ "	"	25.00	
5	1 "	6½x 8½ "	6½ "	"	25.00	
6	1 "	8 x10 "	8 "	"	30.00	
7	1¼ "	11x14 "	10½ "	"	40.00	These 2 sizes will fit into 1 flange.
8	1¼ "	14x17 "	14 "	"	50.00	

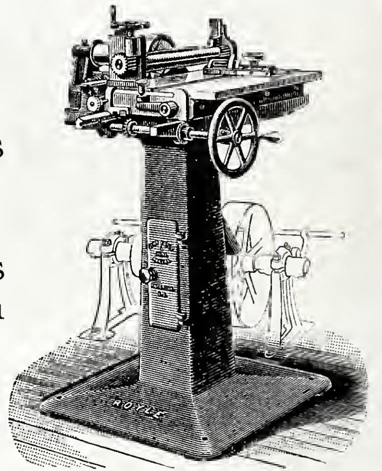
☞ **Nos. 1 to 6 are all made in matched pairs for stereoscopic work. The shorter-focused lenses are especially adapted for street and other views in confined situations. For general purposes, a pair of No. 5 lenses will be found most useful.**

FOR SALE BY ALL DEALERS.

PROCESS-ENGRAVERS

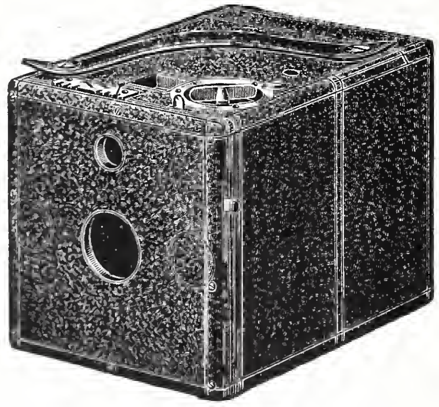
should not attempt to carry on business without suitable tools.

Our Routers, Bevelers, Saws, Shoot-Boards, etc., possess special advantages for modern process work. We are always glad to give full information respecting our productions. Write for Catalogue.



JOHN ROYLE & SONS,
Paterson, N. J., U. S. A.

The Hawk-Eye, Jr.



for the Professional as well as the Amateur.

Price, $8.

Measures but 4¼ x 4¾ x 6 inches, has a square finder, automatic time register, improved time and instantaneous shutter, with different speeds; loads in broad daylight and can be used with film for 12 or 25 ex. or glass plates.

Send for our catalogue of New Cameras.

THE BLAIR CAMERA CO., **Manufacturers, 22 Randolph Street, Boston.**

THE

ACID FIXING AND HARDENING COMPOUND

For NEGATIVES, TRANSPARENCIES, LANTERN-SLIDES and BROMIDE PAPER.

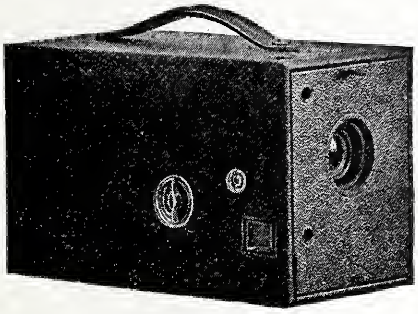
Destroys all developing fog and yields peculiarly beautiful and permanent results.

This solution can be used repeatedly so long as it fixes. It can also be used as a reducer of over density by a long continued treatment.

Price, in one lb. packages, only 25 cts. | In one-half lb. packages, only 15 cts.

FOR SALE BY ALL DEALERS.

"SO SIMPLE A CHILD CAN USE THEM."



THE LATEST.

SUNART JUNIOR, 3 1-2 x 3 1-2.

: : : $5.00 : : :

30 Styles, from $5.00 up to $125.00.

Developing and Printing Outfits, Etc.

Sunart Junior, No. 1, 3 1-4 x 4 1-4
The Sunart Magazine Camera : :
Folding and Cycle Cameras : : :

SUNART TRIPODS.

Send 2 cent stamp for Illustrated Catalogue.

All Stock Dealers handle Sunart Cameras.

SUNART PHOTO CO.,
23 Aqueduct Street, Rochester, N. Y., U. S. A.

Have You
Secured
Your
GOERZ
ANASTIGMATIC
LENS
Yet?
Be sure
You get
One
Made by
Goerz.
(Patented.)

"IN A NEW DRESS."

FOR '97.

Handsomely embossed.

Reflecting surfaces so protected that they cannot become smoked or tarnished.

Rigid bracket. Will not jar or blow out.

Fully protected by patents which will be maintained.

THE BRIDGEPORT BRASS CO.,
BRIDGEPORT, CONN.
19 Murray Street, New York; 17 North 7th Street, Philadelphia; 85-87 Pearl Street, Boston.

THE SCOVILL MAGNESIUM COMPOUND

IS ENTIRELY FREE FROM POISONOUS AND EXPLOSIVE INGREDIENTS.

☞ In order to demonstrate this, quantities have been eaten at various times. It has often been pounded in a mortar to show that it does not explode.

FOR SALE BY ALL DEALERS.

Standard Papers for Photographic Processes.

B. F. K. RIVES

FOR ALBUMENIZING, ARISTOTYPE (GELATINE AND COLLODION), BROMIDE, SOLAR CHEMICALLY PURE PHOTO BLOTTING PAPER.

NEW YORK OFFICE:
621 Broadway (Cable Building).

BLANCHET FRÈRES & KLÉBER,
RIVES—ISÈRE. (FRANCE.)

THINK of something new and protect the invention with a GOOD patent. That's the way others have acquired wealth. Costs nothing to try. Names of inventors wanted. Send for reliable tips to inventors, to **Inventive Age Patent Bureau**, (Pub's "Inventive Age.") Washington, D.C.

KOBE, JAPAN, June 30th, 1897.
THE PHOTOGRAPHIC TIMES PUB. CO., NEW YORK:

Gentlemen: Your post card and THE TIMES for April, May, and June have been received. Your paper is very well gotten up and deserves to have a very wide circulation. It carries an artistic atmosphere with it. Personally I don't remember ever having had such delight out of $5, and I have only had three numbers so far.

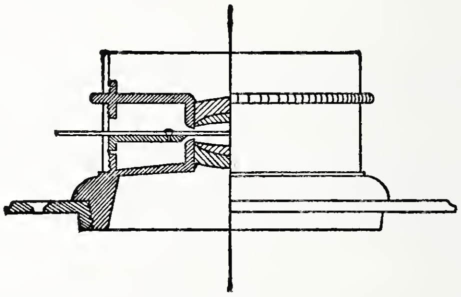
Present my compliments to the staff of the paper, and believe me, very truly yours,

F. B. ABENHEIM.

I want to take this opportunity to compliment you on *The Photographic Times*. All I can say is that I have travelled in many countries, and have always looked up the photographic publications of those different countries, but have never yet found any whose reading material and general "get up" would *in any way* justify my adding my name to their subscription list after having once been a subscriber to *The Photographic Times*.—J. E. H. POST.

The Unrivaled
STEINHEIL LENSES.

SERIES IV. **Rapid Wide-Angle,** specially designed for landscape work and architecture, but can also be advantageously used for flash-light interiors and copying.



SERIES V.

Extreme Wide-Angle, for architecture and interiors, and for very high, broad objects taken from short distances.

The Scovill & Adams Co. of N. Y.,
60 and 62 EAST 11th STREET,
NEW YORK, N. Y.

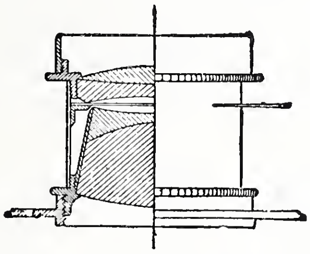
Finest Quality and Absolute Uniformity are the marked features of "PERFECTO" PAPER.

We do not believe in blow or bluster, neither do we claim that we have the only paper in the market. We do say, however, that if "PERFECTO" has an enemy in the world, we have yet to learn it. **What other paper firm can say this?**

"PERFECTO" PAPER SELLS ON ITS MERITS.

THE "PERFECTO" ARISTOTYPE PAPER COMPANY
79 CORTLANDT STREET, NEW YORK.

THE UNRIVALED
STEINHEIL LENSES.



SERIES II.

The best and most rapid lens for general work for both professional and amateur photographers. Remarkable for its powerful and even illumination and sharpness.

Series III. The prototype of all rapid symmetrical and rectilinear combinations. Guaranteed equal to the most expensive lenses of its kind.

Write for catalogue to

THE SCOVILL & ADAMS CO. of N. Y.,
60 and 62 East 11th St. NEW YORK.

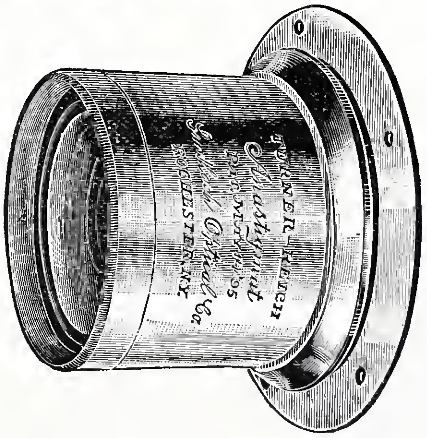
Gems of Landscape
Along the Picturesque Erie

The Ramapo Mountains,
The Shawangunk Mountains,
Greenwood Lake,
The Delaware Valley,
The Valley of the Neversink,
The Blue Mountains,
Shohola Glen,
The Sawkill Falls,
The Raymondskill Falls,
The Bushkill Falls,
Dingman's Ferry,

and a thousand others within a hundred miles of New York. Half tones of these views may be seen in our book, "*Rural Summer Homes*," mailed on receipt of six cents.

D. I. ROBERTS,
General Passenger Agent,
21 Cortlandt Street, New York.

THE TURNER-REICH
ANASTIGMAT LENS


TURNER-REICH
Anastigmat
Gundlach Optical Co.
ROCHESTER, N.Y.

Is **unsurpassed** by any in the market. It has an **aperture** of F. 7. 5., **marvelous depth of focus** and an **absolutely flat field.**

Prices lower than those of any other Anastigmat Lens.

MANUFACTURED BY
Gundlach Optical Co.
ROCHESTER, N. Y.

SEND FOR CATALOGUE.

ACTIEN-GESELLSCHAFT FÜR ANILIN-FABRIKATION
BERLIN
GERMANY
GERMANY
Dr. M. Andresen's EIKONOGEN
United States of America Patent No. 475372.
United States of America Patent No. 475372.
16 oz.
The right of utilizing Eikonogen for photography is protected by Patent in all countries. It is conceded to the buyer of this package and expires on the contents having been used
GESETZLICH GESCHÜTZT

Actien-Gesellschaft für Anilin Fabrikation,
BERLIN.

DEVELOPERS:

Eikonogen, Rodinal, Amidol.

Sold by all Dealers.

Ask your Dealer for Formulae and Samples.

CLEMONS' NEW MATT-SURFACE PAPER.

SOMETHING NEW UNDER THE SUN—A REVOLUTION IN THE ART OF MANUFACTURING.

After many years of scientific research a preparation for the salting of plain photographic paper has been discovered, by which method the finest printing results are obtainable. The advantages are apparent to all.

I.—Constant use will not discolor the silver bath.
II.—Will produce the finest detail in printing.
III.—Any desired tone may be obtained from sepia to jet-black with less gold than ever before.
IV.—The "*New Matt-Surface*" paper when sensitized will keep fresh for a long time if properly stored.
V.—The price has not been advanced.

For sale by

THE SCOVILL & ADAMS COMPANY of N. Y.,

Sample Sheets, by mail, 10 cents each. 60 and 62 East 11th St., New York.

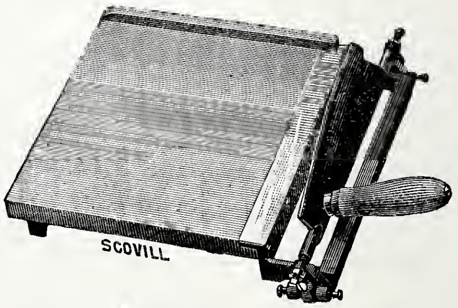
THE SCOVILL REVOLVING TRIMMER.

Has the many advantages, which its name implies, as follows:—

It cuts the paper for the print without removing it from the board or sliding it thereon.

The knife is always in position and sharp, being self-sharpened by the motion which the revolution gives.

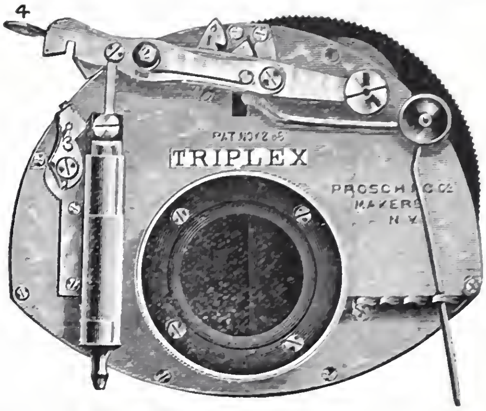
It is very light and attractive-looking and is perfectly suited to the uses of both professional and amateur photographers.



Price (Size of knife ten inches.) Only . . . $4 00.

FOR SALE BY ALL DEALERS IN PHOTOGRAPHIC MATERIALS AND

THE SCOVILL & ADAMS CO. OF N. Y., Trade Agents.



The Triplex Shutter,

the old reliable, still more than holds its own as the shutter finally fixed upon for all-round work, when the cheap and inferior articles preceding it are discarded.

What are its advantages ?

It is optically correct, gives good illumination, and has a real range of speed from time to one one-hundredth of a second.
See our Circulur on these points.

PRICES $14.00 UP.

ATHLETE shutter for rapid Stereoscopic Triplex.
Detective Triplex for detective cameras.

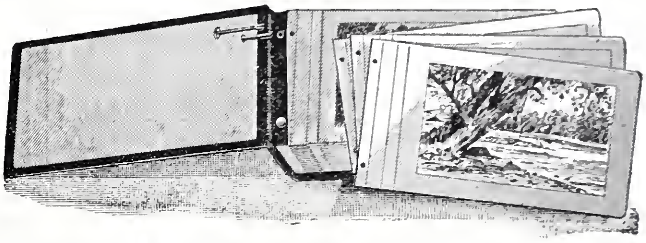
FLASH LAMPS.

Lightning Storage Lamp,	$4 50
Professional Storage Lamp,	9 00

Circulars on Application.

PROSCH MFG. CO.,
389 BROOME ST., NEW YORK.

THE REGENT ALBUM.--INTERCHANGEABLE LEAVES.



The Regent Album combines neatness with durability.

The patent interchangeable feature is constructed in such a manner as to allow the leaves to be readily removed and replaced with little or no trouble and in the twinkling of a moment.

The leaves of The Regent Album lie absolutely flat and are perfectly rigid in the back.

PRICE LIST.

Each Album Containing 25 Leaves.			
No. 1— 6 x 7	$1 25	Extra Leaves, White or Gray, per doz.,	$0 35
No. 2— 7 x 10	1 50	" " " " " "	45
No. 3—10 x 12	2 00	" " " " " "	75
No. 4-11 x 14	2 50	" " " " " "	1 00

Leaves for Squeegee Photographs.		
No. 1— 6 x 7	per doz.,	$0 50
No. 2— 7 x 10	" "	70
No. 3—10 x 12	" "	1 25
No. 4—11 x 14	" "	1 55

The Regent Albums are bound in full cloth, handsomely embossed, finished with gilt title, and enclosed in a neat box.

THE LEAVES AND COVERS ARE ROUND CORNERED.

THEY ARE MANUFACTURED AND PATENTED BY FELIX REIFSCHNEIDER.
FOR SALE BY ALL DEALERS AND THE TRADE AGENTS,

THE SCOVILL & ADAMS CO. OF N. Y., - - - - 60 and 62 East 11th St., New York.

DO YOU MAKE

FLASH LIGHT PICTURES?

IF SO YOU MUST KNOW

BLITZ PULVER

The Standard Flash Light Powder in the United States.

60 cents per package.

For Igniting Blitz Pulver use McCollin's Igniter, - - Price $1.50

For Interiors, where quickness is not needed, use Hemperley's Magazine Flash Lamp for Magnesium Powder only, Price $2.75

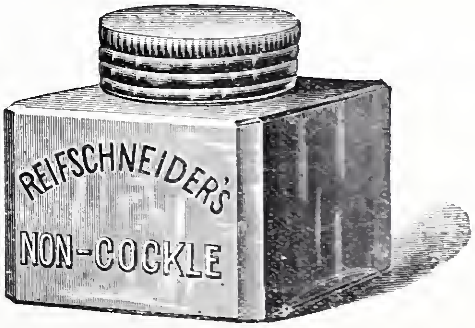
For particulars of the above, send for our circulars.
Send 25 cents for a complete book on Photography, or a copy of *American Journal of Photography.*

THOS. H. McCOLLIN & CO.,
Photo Specialists,
1030 Arch St., PHILADELPHIA.

"NON-COCKLE,"

FOR MOUNTING PRINTS.

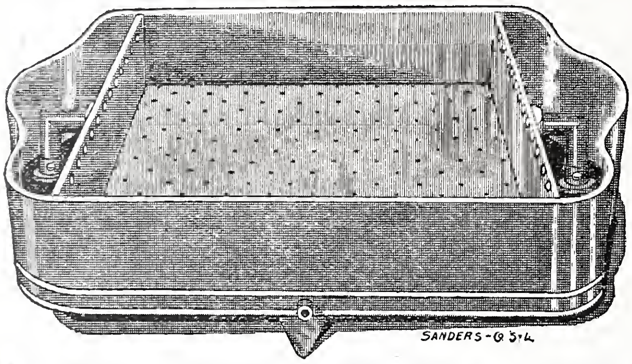
GUARANTEED NOT TO COCKLE.



40 Cents per Bottle.

For Sale by all Dealers in Photographic Goods.

THE CALIFORNIA AUTOMATIC PRINT WASHER,



WILL H. LEIGH, Inventor.

The principle on which the Automatic Washer is constructed provides for a constant and complete change of water with an upward and circular motion from being forced through the small holes, and an automatic rocking of the tank gives the entire body of water exactly the same motion that separates the prints in the ordinary tray by rocking. With this apparatus prints never settle to the bottom of the tank, but float in the water and move gently from side to side.

The face of each print is in this way presented to the moving water and imperfect washing is an impossibility.

Prints require no watching nor handling with this washer, thus saving its cost in labor alone.

They are furnished in three sizes, and made and finished for service and wear.

PRICES.

12x12 inches	**$ 7.00**
20x20 inches	**$ 8.50**
25x25 inches	**$10.00**

Leigh's-Combination Photograph-Printing Frame.

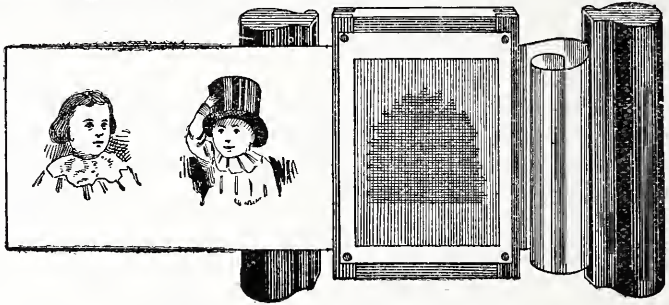
To quote the words of Mr. W. H. Leigh, the inventor, we would say that "The important point we claim for this frame is the doing away with joint lines, and equalizing the space between subjects for combination photographs, **WITHOUT CUTTING DOWN NEGATIVES**, thus often ruining them for future orders for single cabinets, etc."

Prints from ten inches to ten feet in length can be made from as many negatives as desired. The prints can be made side by side, or one above the other. Nothing makes better display work, nor attracts the public eye more than the **COMBINATION PHOTOGRAPH**.

We furnish two styles of frames, one to open in the regular way, taking paper the narrow way of the frame, and the other with lengthwise opening, taking the paper as shown in the illustration.

PRICES FOR EITHER STYLE COMPLETE.

5x7	**$2.50 each.**	**6½x8½**	**$3.00 each.**
5x8	**$2.50 each.**	**8x10**	**$3.50 each.**



FOR SALE BY DEALERS.

H. A. HYATT, Manufacturer, N.E. Cor. 8th & Locust Sts., ST. LOUIS, MO.

JONESBORO, TENN., May 4, 1897.

MESSRS. ALLEN BROS., DETROIT, MICH.

GENTLEMEN:—When I returned the 5 B Suter Lens, keeping the 3 A, I promised to let you know what I thought of the Suter Lens.

Well, I can safely say it is the best lens I ever owned, and, as I wrote you before, I had used fourteen different lenses and some of them were considered the best made, and I thought them pretty good till I tried the ones you sent me, and found so much difference that I am sorry I did not buy a Suter long ago. If I had, would have saved dollars in material, saying nothing about the trouble and disappointments that I have had with them. I have used the 3 A Lens for various kinds of work, in and out of doors, and every time I have gotten good results. For the past two weeks I have been making Views for a Society that is getting up pictures of all the old places of historic note about here, and have not yet failed to get a good picture, and if I had used other lenses I have, I am confident I would have failed on some of them, for some of the views were very difficult objects to photograph.

If there is anything you can get out of this that will be of any use to you, in the way of praise or recommendation to others in regard to the Suter Lens, you are welcome to use it; cut it down and pick out what you want, and if there is anyone you wish to refer to me for testimony, will gladly answer them. I am no optician, but think I know when a lens does the work as it should.

Yours very respectfully,

O. L. HENSLEY.

BARGAINS ! !

SEND TO

The Scovill & Adams Co. of New York,

60 & 62 E. Eleventh St., New York,

. . . FOR PRICES OF THE . . .

High Quality American Optical Co's VIEW CAMERAS,

Which they are offering at half price.

SPECIAL NOTICE.

P. P. P.

PAGET PRIZE PLATES for Lantern Slides.

UNEXCELLED FOR QUALITY AND BRILLIANCY OF TONE.

HIGHLY SPOKEN OF BY THE PRIZE WINNERS.

Read what they say:

NEW YORK CAMERA CLUB,
New York, March 30, 1896.

MR. W. C. CULLEN:

Dear Sir:—In answer to your inquiry, would say, I consider the Paget Lantern Slide Plate as without a rival. It is the only plate within my knowledge on which a variety of pleasing tones, running through the blacks, browns, purples and reds, can be produced at will, by *development* alone.

Yours truly,
WM. A. FRASER.

SOCIETY OF AMATEUR PHOTOGRAPHERS OF N. Y.,
March 26, 1896.

MR. W. C. CULLEN:

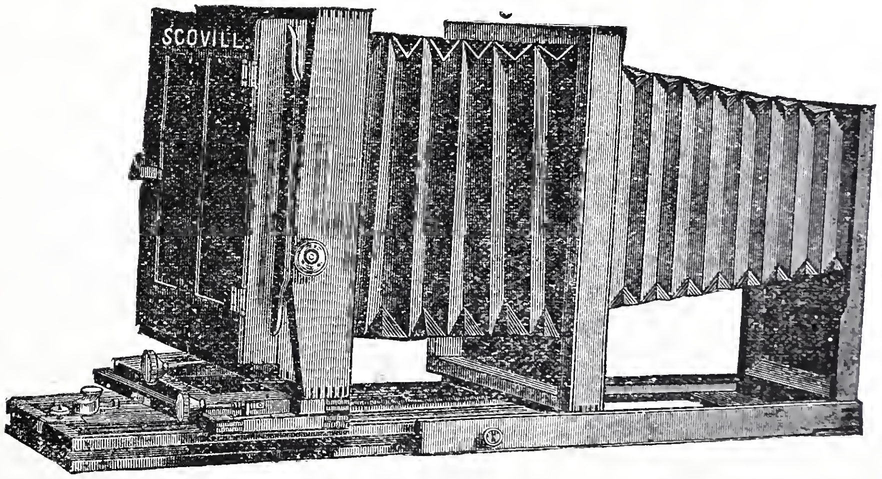
Dear Sir:—The Paget Lantern Slide Plates are superior to anything I have used. The majority of my prize slides were made with them.

Very truly,
W. B. POST.

W. C. CULLEN, Sole Agent for U. S.,
61 WILLIAM STREET, NEW YORK.

THE AMERICAN OPTICAL COMPANY'S

UNRIVALED PORTRAIT CAMERAS.



The American Optical Company Portrait Cameras are manufactured from the best mahogany, French polished, and have double bellows, vertical shifting front, the V-shaped wooden guide, telescopic platform, and Lever Focusing Attachment, by which the most delicate focus can be adjusted with the utmost facility and ease.

No.	Size.		With Double Swing-back.
5	8x10 ins.,	with platform 30 in. long	$38 00
6	10x12 "	" " 36 "	48 00
7	11x14 "	extension " 48 " and vertical shifting front	64 00
8	12x15 "	" " 48 " do	72 00
9	14x17 "	" " 60 " do	76 00
10	16x20 "	" " 65 " do	88 00
11	17x20 ins.,	extension platform 65 in. long and vertical shifting front	$90 00
12	18x22 "	" " 70 " do	100 00
13	20x24 "	" " 72 " do	110 00
14	22x27 "	" " 72 " do	130 00
15	25x30 "	" " 80 " do	170 00

(Taken on a Carbutt Orthochromatic Plate,
By Alois Beer, Photographer to Emperor of Austria.)

To obtain Artistic Results, as much care must be used in the selection of the Plates or Films as the Camera.

CARBUTT'S PLATES AND FILMS Give Universal Satisfaction.

Also J. C. DEVELOPING TABLOIDS,
Put up in 3 sizes; Price, 25c., 40c., 75c.

If you intend competing for prizes, let us assist you in winning by the aid of our Plates, Films and Developer.

STANDARD
FOR
TWENTY YEARS.

FOR

Economy, Simplicity and Perfection in Development,

USE

CARBUTT'S J. C. TABLOIDS

FOR

SNAP AND SHORT EXPOSURES.

Crush and dissolve 2 J. and 2 C. in 3 oz. water (for a Carbutt B, time exposure, use 4 oz. water), filter through absorbent cotton, flow over plate, note how many seconds it takes for image to show (usually about 30 to 40 seconds), multiply this time by 6, and at the end of that time wash plate and fix in usual fixing bath, 1 oz. Hyposulphite of Soda and 4 oz. of water, wash for half hour, then dry.

PRICES:
25c., 40c. and 75c. Per Box.

FOR SALE BY ALL DEALERS

CARBUTT

SEND FOR CIRCULARS

FILMS
(CUT SIZES)

PLAIN and ORTHOCHROMATIC

EUREKA RIBBON FILM
(NEGATIVE AND POSITIVE)
FOR
Chronophotographic Cameras

Perforated to Edison Gauge, and furnished in rolls of one piece, from 75 feet to 450 feet.

$3.75 per Roll 75 feet, Unperforated
$4.50 per Roll 75 feet, Perforated

SPECIALTIES:

Color Screens
Sizes 2¼x2¼ and 3¼x3¼.

Color Screens
For Photochromic Process.
Sets only. Sizes 2¼ x 2¼ and 3¼ x 3¼.

Multum-in-Parvo Lantern

Lantern Slide Mats

Lantern Slide Binders

Thin Crystal Cover Glass.

Developers.

PLATES

- ECLIPSE
- ECLIPSE JUNIOR
- Orthochromatic 23 x 27
- D. T. NON-HALATION
- B 16
- X-RAY PLATES
- Transparency Plates (Plain or on Ground Glass)
- LANTERN PLATES
- STRIPPING PLATES
- HALF-TONE PROCESS

JOHN CARBUTT, KEYSTONE DRY PLATE AND FILM WORKS, **WAYNE JUNCTION, PHILADELPHIA.**

"Some Mounting Paste, please" says Inexperienced, and gets what the salesman pleases.

"Some ***HIGGINS' PHOTO MOUNTER,"***

says Experienced, and gets what pleases **him.** The difference is in the articles, and the moral is—if you want a **good thing** ask for it.

HIGGINS' PHOTO MOUNTER is a beautiful, pure, white adhesive, finely scented. A perfect homogeneous solution in a soft, pasty form, from which the water never separates, as in the common starch or flour pastes. Its beautiful, soft, unctuous consistency, and its wonderful smooth and easy spreading qualities (non fluid at rest but fluid under the movements of the brush) are possessed by no other adhesive, and are of the greatest importance in perfect and easy mounting. Does not strike through nor warp, adheres instantly and powerfully, dries quickly and prevents curling off at the edges. Guaranteed never to change or deteriorate. Unequaled for mounting photographs, textile samples, scrap-books, tissue work, and general use as a substitute for mucilage.

REFUSE ALL IMITATIONS.

FOR SALE BY ALL PHOTO SUPPLY HOUSES.

A 3-ounce jar, prepaid by mail, for thirty cents, or descriptive circulars for nothing, from

CHAS. M. HIGGINS & CO., *Sole Manufacturers,*

London Office, 106 Charing Cross Road. 168-172 Eighth St., Brooklyn, N. Y., U. S. A.

PHOTOGRAPHIC GOODS

OF EVERY DESCRIPTION.

SWEET, WALLACH & CO.

215-221 WABASH AVENUE,

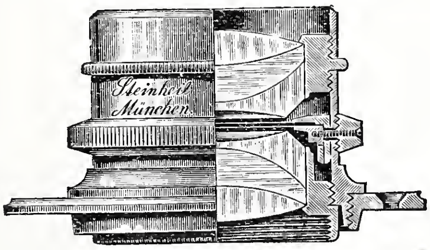
CHICAGO.

Largest and Best Assorted Stock in the World

= = The Latest = =

Steinheil Lens.

Orthostigmat. F 6 8/10. Angle 85°.



Steinheil's latest production is a **Universal** Lens, combining, in a degree hitherto not thought possible, the qualities of the most rapid lenses used for

Instantaneous Work, Portraits, Etc.,

with those of the Wide Angle variety, used for

Landscapes, Interiors, and Copying.

Do not fail to give this truly wonderful lens a trial before purchasing any other.

H. G. RAMSPERGER & CO.,

SOLE AGENTS,

180 PEARL STREET, NEW YORK CITY.

THE FAST MAIL LINE.
Cliffs on the Mississippi
IRON MOUNTAIN ROUTE
ST. LOUIS TO
ARKANSAS, TEXAS
MEXICO (THE EGYPT OF THE NEW WORLD)
AND
CALIFORNIA.
ELEGANT THROUGH SERVICE VIA THIS
THE TRUE SOUTHERN ROUTE
TO THE
WINTER RESORTS OF THE SOUTHWEST
Write General Passenger Agent for
Pamphlets giving Particulars.
C.G. WARNER,
W.B. DODDRIDGE,
H.C. TOWNSEND,
ST. LOUIS

WUESTNER'S
EAGLE DRY PLATE CO.

Our Plates Commence with Emulsion No. 5000 and are made in three grades of speed:

X Slow.
X X Medium.
X X X Quickest Plate Made.

Wuestner's CYCLONES (White Label, XXX)

For snap-shot and quick studio work. They are the quickest, the cleanest, and most brilliant plates in the market, and have more latitude than any known brand.

Wuestner's JERSEY BEAUTIES (Green Label, XX)

For general use. They are unexcelled for viewing, and are used by seven-eighths of the view photographers throughout the country.

As a guide to compare the speed between all known American and European Plates: At the test made by Watkins' Sensitometer, in England, **May, 1896,** our Cyclone XXX and Orthochromatic XXX Plates showed the highest test, number 150, while the European brands only reached the 120 mark.

Our plates fix and print in half the time that others require. No blistering or frilling with any of our brands of plates. Try them once, compare discount and plates and you will use no others.

WUESTNER'S EAGLE DRY PLATE CO.

Jackson Place, JERSEY CITY, N. J.

S. P. C. MONOGRAM

On a bottle of chemicals is a guarantee of excellence.

Insist on having the "S. P. C." brand.

For Sale by all the Trade.

ARE YOU USING

The "World" Special Photo Finish . . . **Blotting Paper?**

It is chemically pure, and will not lint.

ASK YOUR DEALER FOR IT. TRY IT.

Every sheet of the genuine bears embossed water mark of "World" Blotting.

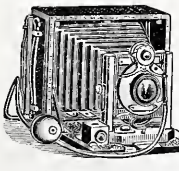
The Scovill & Adams Co. of New York, Trade Agents.

Scientific Books Our catalogue S, is sent free for the asking. It lists books pertaining to all the sciences. A copy should be had for ready reference by those desiring electrical, medical, engineering, scientific, mining and technical books, which we sell to everybody at wholesale prices.

Montgomery Ward & Co., Chicago.

TIPS TO INVENTORS How and where to get a good patent —cost — promotion —Sale. Full instructions and terms. **"The Inventive Age, Washington, D. C."**— 7th year of only publication exposing frauds on inventors.

Photographic Times. – Exquisite! That just about expresses the general opinion regarding the *Photographic Times*, an illustrated monthly magazine devoted to the interests of artistic and scientific photography. The March number is no exception. Typographically it is a beauty. While to the photographer, whether professed or amateur, it is an indispensible necessity.



.CAMERAS.

From $2.50 to $100.00

DEVELOPERS, TONING AND FIXING BATHS, NEGATIVE RACKS, PLATES, TRAYS, PAPERS, TRIPODS, PRINTING FRAMES, CARDS, ETC., ETC

CATALOGUE FREE. DEALERS SUPPLIED.

JAS. H. SMITH & CO., 311 WABASH AVE., CHICAGO.

USE THE

Standard Dry Plate.

They are the best high grade plate on the market, which are sold at the lowest popular prices.

Incomparable for the Studio and Hand Camera, absolutely clean, uniform and rapid.

We manufacture Non-Halation process, transparencies, plain and ground glass, lantern slide and X-ray Plates.

You will make no mistake in ordering the "STANDARD."

STANDARD DRY PLATE CO.,
LEWISTON, MAINE.

THE WATERBURY ALBUM

Is the latest thing on the market in the way of an Interchangeable Leaf Album.

Embossed Black
Cloth Covers,
White Leaves.

NOTE THE LIST PRICE.

7 x 10,	10 x 12,	11 x 14,
$1.10	**$1.60**	**$2.00**

THE SCOVILL & ADAMS CO. OF NEW YORK,
60 and 62 East 11th Street, New York City.

Look out for imitations of

REDUCED PRICE LIST.

WATERBURY CARDBOARD.

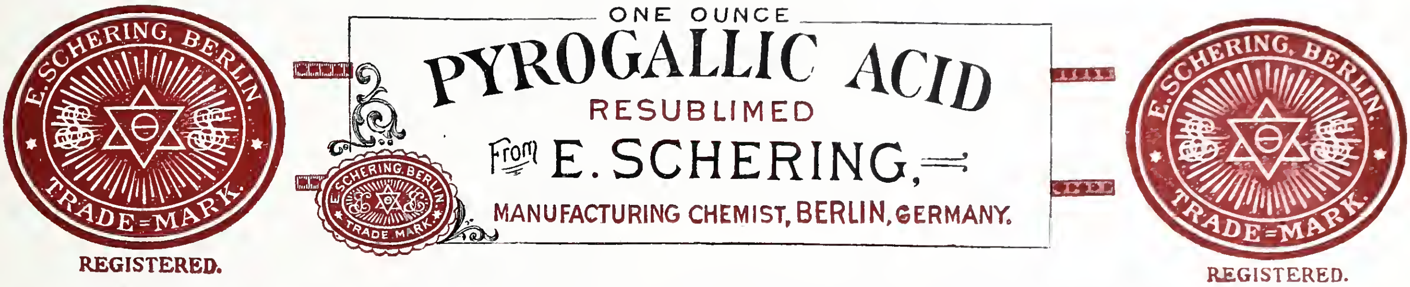
Look out for the genuine, too, and see that you get it.

WITH NEW PRICES. SEND FOR A SAMPLE

It is the Best and Cheapest.

When purchasing a Developer please be particular to specify **Schering's** the oldest and most favorably known brand.

Put up with labels and seals as per fac-similes here given.



ONE OUNCE
PYROGALLIC ACID
RESUBLIMED
From E. SCHERING,
MANUFACTURING CHEMIST, BERLIN, GERMANY.

E. SCHERING, BERLIN
TRADE=MARK

REGISTERED. REGISTERED.

THE STANDARD OF THE LAST—THIRD—EDITION OF THE GERMAN PHARMACOPŒIA.

See that you get the Genuine "Schering's." Excelled by none

Send Orders to your Dealers, or to

THE SCOVILL & ADAMS COMPANY OF NEW YORK.

Remember

THAT

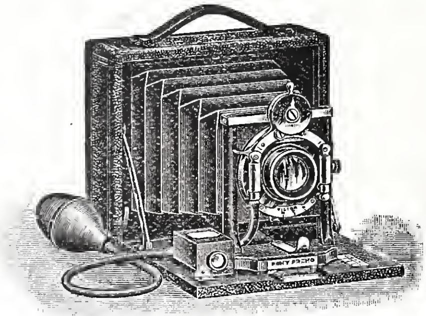
"Three Crown"

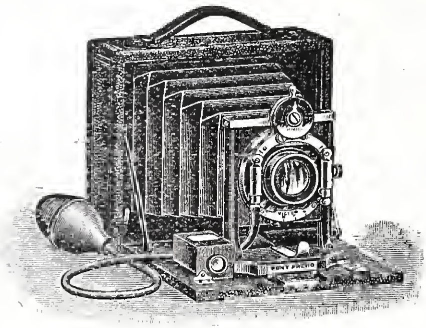
Albumen Paper

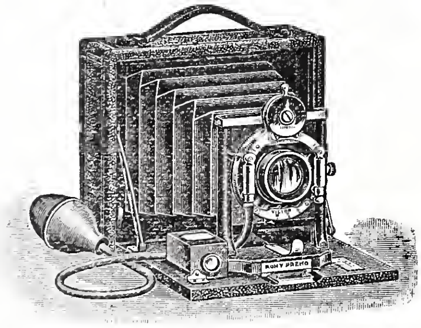
Is absolutely the BEST.

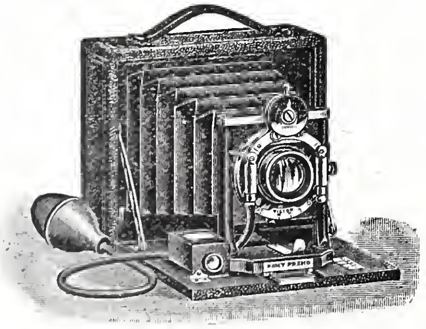
WHY?

Because none but the Best of the Rives Paper is selected for Albumenizing the THREE CROWN BRAND. It is therefore free from the imperfections often to be found in other brands, which arise from defects in the plain paper, and hence cannot be avoided.









PREMO CAMERAS

'97 STYLES NOW READY.

PREMOS PRODUCE

PERFECT PICTURES.

The PREMO is in use by Leading Amateur and Professional Photographers.

Is it necessary to say more?

If you want the best—get a Premo.

Send for Complete Premo Catalogue.

Rochester Optical Co.,

ROCHESTER, N. Y.

Bausch & Lomb

OPTICAL Co.

ROCHESTER, N.Y.

NEW YORK CITY. CHICAGO.

ZEISS-ANASTIGMAT LENSES

MOST POPULAR IN AMERICA.

We use in the manufacture of Zeiss Anastigmat Lenses not only the finest of Jena Glass and the most approved forms of mounts, but that equally important factor, the skill and accurate methods of working gained in nearly fifty years of lens making. Every lens is so thoroughly tested before leaving our factory that it is *impossible* for an imperfection to pass. Catalogue, large Test Chart and Ray Filter Booklet free. Address Dept. H.

Attached for use.

We ORIGINATE
thus always in
the lead of all

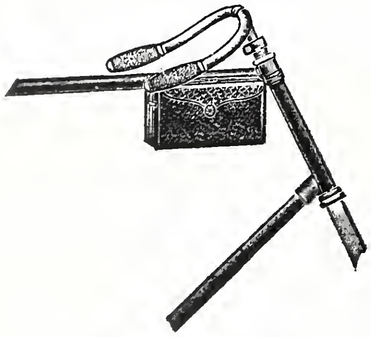
Our Styles for '97 are complete.

Packed in Case.

POCO and Cycle POCO

ARE ALWAYS LEADERS.

See our Patented Poco combined finder and level, get one for your camera. It is the only perfect view finder made.

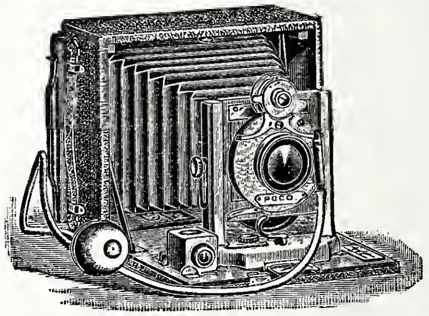


Attached for Carrying.

Poco Cameras

Take everything
in sight.

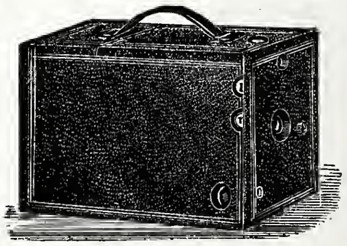
ROCHESTER CAMERA CO.



Open.

GEM POCO

the only $5.00 Camera.



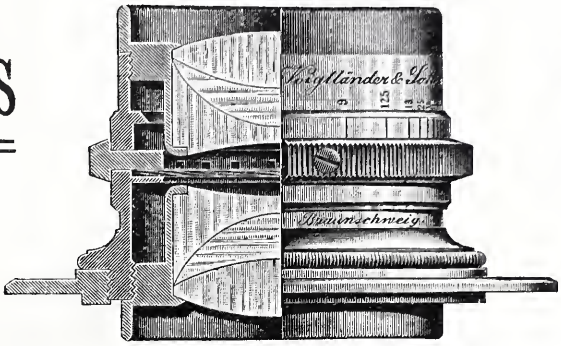
Rochester Camera Co.,

ROCHESTER, N. Y., U. S. A.

The Finest Lens yet Produced

: : : IS : : :

Voigtlander's Marvelous COLLINEAR LENS.



: : : THE FAMOUS : : :

Voigtlander Portrait and Euryscope Lenses,

Filling special needs, continue their popularity unabated.

The Genuine . DARLOT LENSES for all kinds of work, also best for STEREOPTICONS are still to the fore.

The above Lense for sale by all Dealers and the Sole American Agents:

BENJ. FRENCH & CO., - - Boston, Mass.

Announcement for 1897.

PLATINOTYPE PAPERS OF EXCELLENT AND UNIFORM QUALITY.

AND THE ART REMBRANDT MOUNTS (PATENTED.)

A A—thin paper, having a smooth surface.
B B—heavy paper, having a smooth surface.
C C—heavy paper, having a rough surface.

Sample package of either of these papers with developer, by mail on receipt of 25 cents.

The Platinotype and Rembrandt Mounts (patented) are superior for Art Effects.

Sample package of either **A A**, **B B**, or **C C** papers on receipt of 25 cents.

Sample Portrait or Landscape mounted on Rembrandt on receipt of 15 cents.

Eight Hollinger Portrait Studies on Rembrandts on receipt of $1.50.

Send for Illustrated Pamphlet,

WILLIS & CLEMENTS,

1624 Chestnut Street, - - - - - - Philadelphia.

The Lundelius Magazine Camera, Patented.

For Professionals and Amateurs.

Small, Light, Complete, Always Ready, and under Positive Control.

NO Doors to Open. Slides to Draw. Plate Holders. Shutters to Set. Loose Parts. Obstrusive Fixtures.

But only to

Release the Shutter and turn down the Plate.

Operated entirely from the Outside to Focus, Change Plates, Diaphragm, and Speed of Shutter.

Indicator showing the number of unexposed plates.

Made in *three* standard sizes, 3¼ x 4¼, 4 x 5, and 5 x 7.

Fitted with the following Lenses made by Gundlach Optical Co.:

Turner-Reich Anastigmat, Instantaneous Symmetrical, and Single Achromatic,

All fitted with Iris Diaphragms.

Carries TWELVE Plates or Cut Films.

Catalogue, Testimonials, and Sample Photos on application.

Manufactured by **The Lundelius Camera Co., Incorporated, Port Jervis, N. Y.**

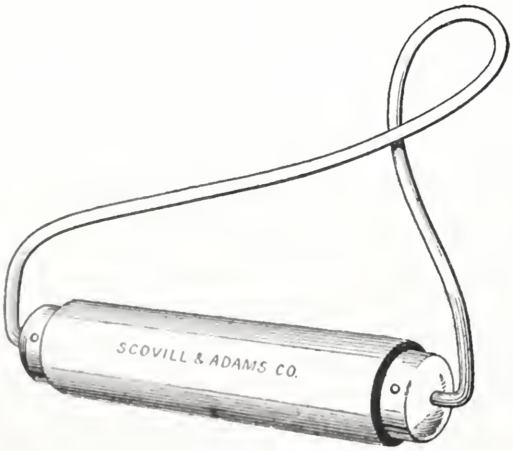
For Night Photography

Why? **The Scovill Magnesium Cartridges Are the best**

Because they give a more actinic light, produce less smoke, and are safer than any other in the market.

THE SCOVILL & ADAMS CO. OF N. Y.

60 and 62 East 11th Street.


SCOVILL & ADAMS CO.

SOMETHING NEW.

The Simplex Print Roller

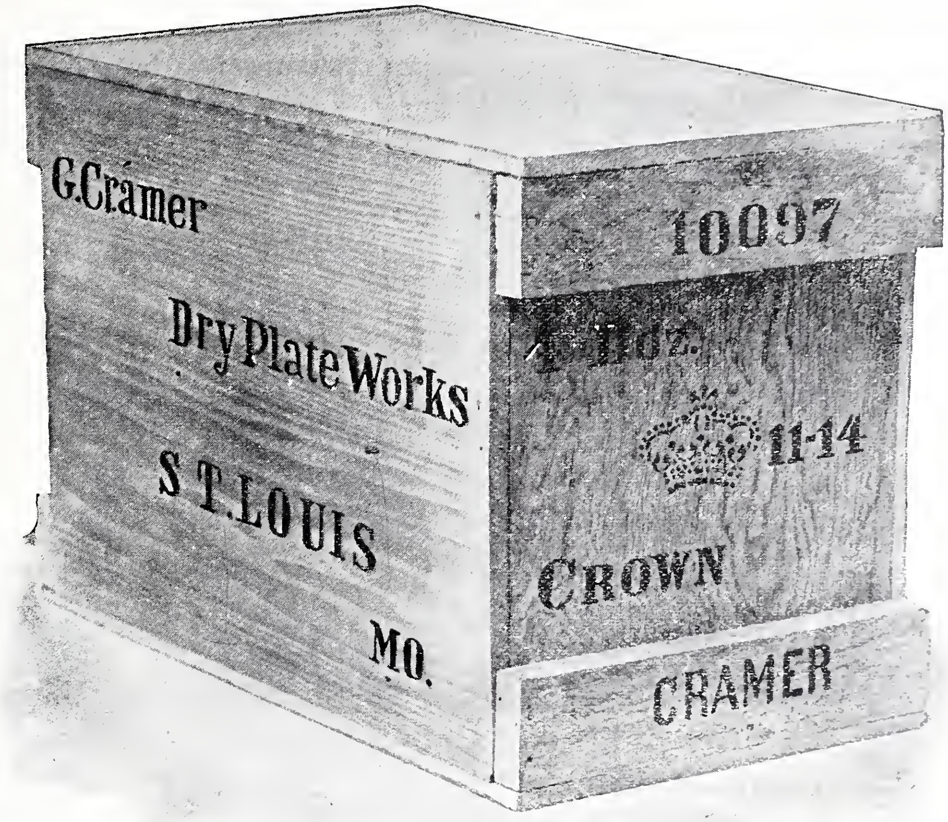
IS SIMPLE AND CHEAP.

ASK YOUR DEALER FOR ONE.

PRICE, 50 CENTS.

FOR SALE BY ALL THE TRADE, AND

THE SCOVILL & ADAMS CO. OF N. Y., Trade Agents.


G.Cramer
Dry Plate Works
ST.LOUIS
MO.
10097
4 Doz.
11-14
CROWN
CRAMER

Nepera Chemical Co.'s Products.

REX and
NEPERA, Glossy Printing-out Papers with a hardened gelatine film.
Rex 90 cents.—Nepera $1.35 a gross.

RUBENS, Glossy collodion, $1.35 a gross.

REMBRANDT, a Matt Printing-out Paper.

NEPERA-BROMIDE,

THE BEST YET MADE

REDUCED PRICES!

Platinoid, for Platinum effects.
Enameled.
Rough-Surface.

VELOX, The Paper of the Future.

Matt or glossy. 500 times quicker than albumen. Can be printed by daylight or by artificial light. No dark room required. Keeps indefinitely. Not affected by heat or dampness.

PERMANENT RESULTS.

50 Cents for trial packages, containing 2 doz. cabs. or 4 x 5 developer and two sample prints.

Nepera Chemical Co.,

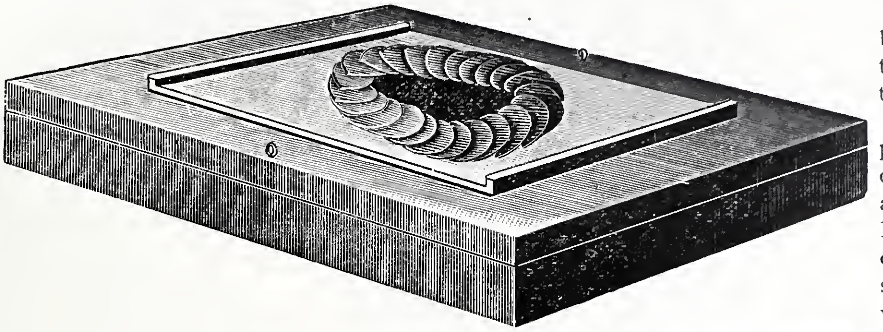
NEPERA PARK, N. Y. = **Sole M'f'rs.**

Branch offices: CHICAGO, Ill., 19-21 Quincey St. *PARIS, FRANCE, 8 Rue Martel.*

California Camera Co. San Francisco, Trade Agents for the Pacific Coast.

The Dixie Vignetter

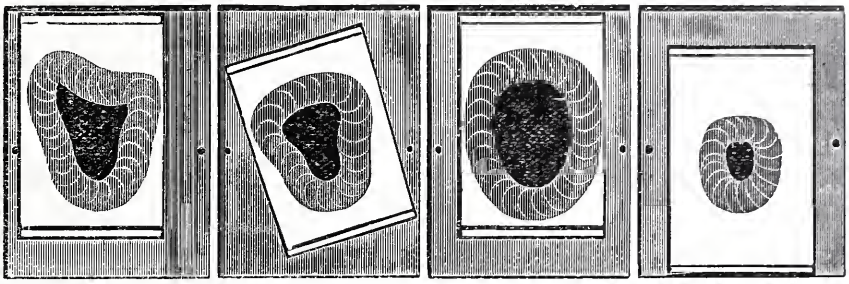
The first and only successful Adjustable Vignetter.



Practical, Cheap, Simple, Durable, and Indispensable to all Photographers who keep up with the times.

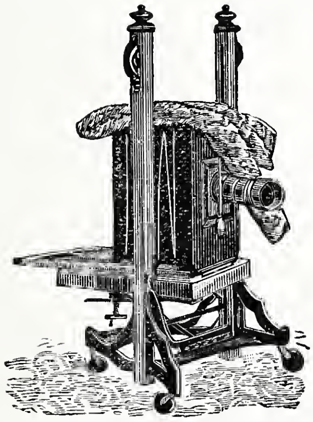
It is attached to the ordinary printing frame, and can be quickly, easily, and accurately adjusted to any negative — the Pear, Oval, Round, Square, or any desired opening can be produced of any size required, and right where it is wanted.

The annexed cut shows a few of its many possible adjustments. The Dixie Vignetter is all complete. No separate parts to cost extra and get mislaid and broken, and it is always ready for use. It costs but a trifle and will pay many a dollar in time saved, besides producing superior results.



The Scovill and Adams Company of New York,

60 and 62 East Eleventh Street, New York.



700 Photographers are NOW USING the

SEMI-CENTENNIAL CAMERA STAND.

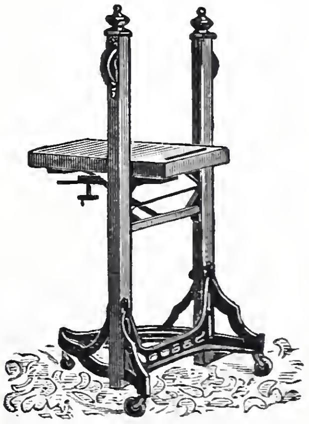
THIS BEATS THE RECORD.

All Dealers sell them.
All Photographers like them.
All should have them.

Send for Price List. The ONLY Stand that gives satisfaction.

HORGAN, ROBEY & CO.

34 Bromfield St., Boston, Mass.



PRINTING-OUT PAPERS

Send twenty cents in Stamps for Sample Package.

MAXIMA PAPER, for Amateurs,

ARMOR BRAND, for Professionals.

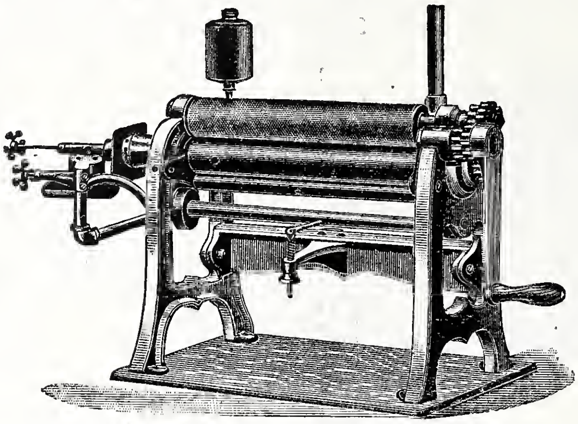
INSOLUBLE FILMS.

Invaluable during the hot summer months. No frilling, no curling, no hardener required. Pure whites. Cabinets, $5.75 per gross. Other sizes in proportion.

United States Aristotype Co.,

Correspondence with Dealers invited. **BLOOMFIELD, N. J.**

ACME BURNISHERS.



ACME ARISTO BURNISHER.

The Acme Aristo Burnisher gives the best gloss and is the simplest Burnisher made and is the only hollow roll Burnisher made that can be heated by oil, gas, or gasoline.

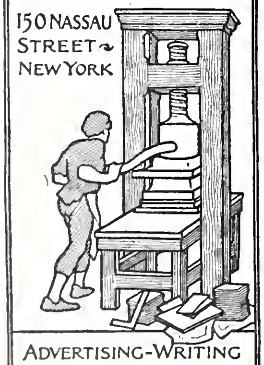
Remember it is fully guaranteed. Give the Acme Aristo a trial and be convinced as others have been.

ASK YOUR DEALER FOR NEW CATALOGUE.

ACME BURNISHER CO., Fulton, N. Y.

VECHTEN WARING

150 NASSAU
STREET
NEW YORK



ADVERTISING-WRITING
ADVERTISING-PRINTING
ADVERTISING-ILLUSTRATING

ADVERTISING CAMPAIGNS OUTLINED, AND BUSY MEN HELPED IN THE WRITING OF ADVERTISEMENTS AND THE ARRANGING OF DISPLAY EFFECTS.

ASSISTANCE GIVEN IN THE COMPILING OF CATALOGUES AND PRICE LISTS, AND COPY PUT IN GOOD SHAPE FOR ECONOMICAL PRINTING.

THOUGHT GIVEN TO THE ARTISTIC AND FORCEFUL ARRANGEMENT OF TYPES, AND VERY REAL EFFECTS PRODUCED IN THE ILLUSTRATING OF GOODS FOR CATALOGUES—IN BLACK OR COLORS.

VECHTEN WARING, 150 Nassau St., New York.

Made on Dirigo Dry Plate $\frac{1}{500}$ Second Exposure.

IF YOUR DEALER DOES NOT KEEP THEM SEND DIRECT TO

Dirigo Dry Plate Works, 231 Middle St., Portland, Me.

WANTED—No. 528, Vol. 21; 620-639, inclusive, Vol. 23; 537–551, inclusive, Vol. 22; also title-page and index of Vol. 24 of PHOTOGRAPHIC TIMES, for which 15 cents a number will be paid.

HARTFORD PUBLIC LIBRARY,
Hartford, Conn.

SNAP SHOTS

and all other Photographic Exposures are best developed with

Mitchell's Developing Powders.

They are permanent, portable, convenient and reliable. The developer need only be mixed **when needed**, and is always **fresh** and **strong.**

PHAINOGEN	75 cts. per pkg.
EIKO-QUINONE	50 " "
SNAP SHOT	50 " "
BROMIDE PAPER	35 " "
EIKONOGEN	25 " "
HYDROKINONE	25 " "
PYRO	25 " "

CAN BE SENT BY MAIL. POSTAGE 5 CTS. EXTRA.

Ask your local dealer for them. If he does not keep them write to us direct and we will forward promptly by mail on receipt of price and postage. Special descriptive circular **free** on application. Address,

CHARLES L. MITCHELL, M.D.,
1016 CHERRY STREET, PHILADELPHIA.

A full line for sale by the SCOVILL & ADAMS CO.

20 BOOKS

ON 20 DIFFERENT SUBJECTS, BUT ALL RELATING TO SOME DELIGHTFUL PHASE OF AMERICAN TRAVEL, VIA "AMERICA'S GREATEST RAILROAD."

ILLUSTRATED CATALOGUE SENT FREE, POST-PAID, ON RECEIPT OF A 1-CENT STAMP BY GEORGE H. DANIELS, GENERAL PASSENGER AGENT, NEW YORK CENTRAL & HUDSON RIVER RAILROAD, GRAND CENTRAL STATION, NEW YORK.

The "SIMPLEX"

Printing Frame

Light, Compact,
Simple, Durable
and Inexpensive.

The Frame is made of Japanned Iron, with Wooden Back, covered with Billiard Cloth.

IT SELLS ON SIGHT!

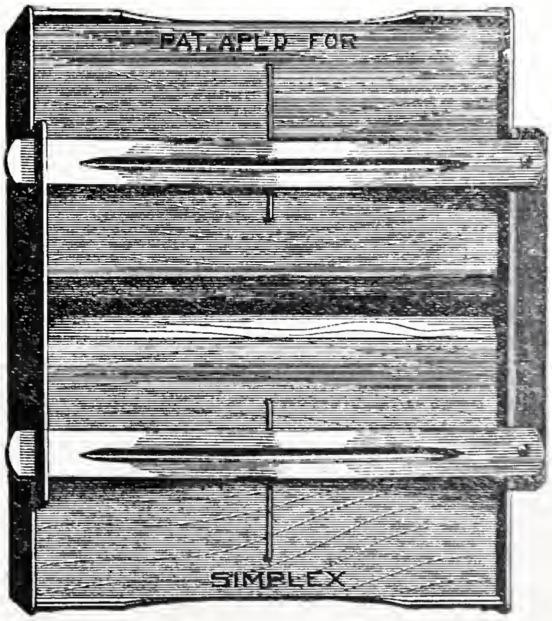
Prices as follows:

3¼ x 4¼, 3½ x 3½,	24c.
4 x 5,	25c.
5 x 7,	32c.
5 x 8,	35c.

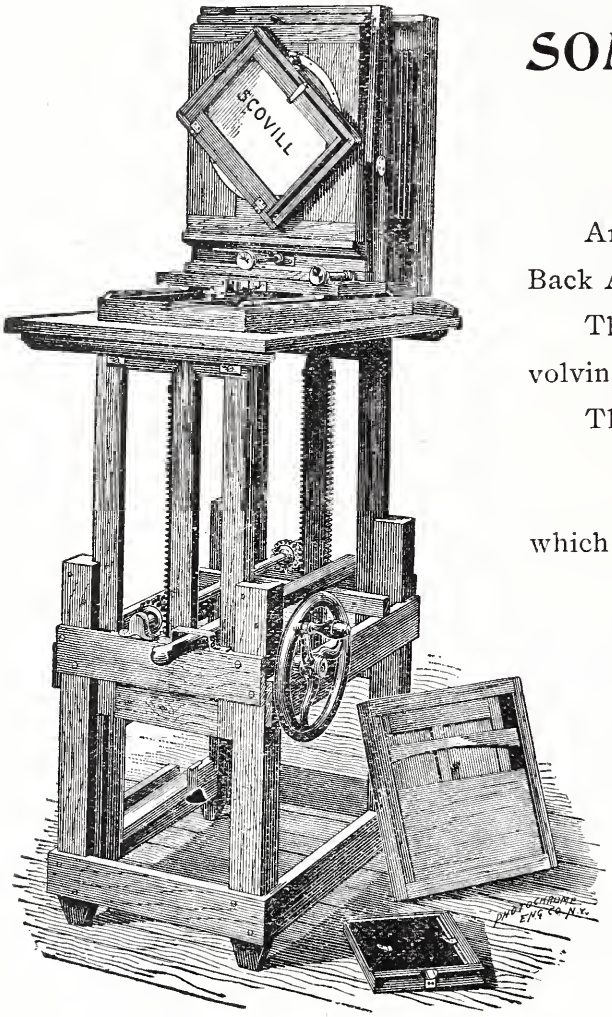
For Sale by all Dealers, and....

The Scovill & Adams Co. of N. Y.,

60 & 62 East 11th Street, NEW YORK.



The Empire Portrait Outfit



SOMETHING NEW

For the Gallery.

An 8 x 10 Portrait Camera, fitted with a Revolving Back Adjuster for 5 x 7 plates.

The position of the plate is changed by simply revolving the turn table of the adjuster.

The outfit comprises also an

Empire Camera Stand

which description we give as follows :

Highest Point from Platform to Floor,	**41**	**Inches.**
Lowest Point from Platform to Floor,	**26**	"
Width of Platform,	**18**	"
Length of Platform,	**30**	"

* * *

THE elevating is done by turning a handled wheel at the side of the stand ; the gearing from this connects with the front and rear platform support, causing the platform to rise or fall according to which way the handle is turned.

All the back of the stand is a lever, which, when pressed to the right, throws the gear wheel in front out of gear, and locks the front platform support. On turning the handled wheel from you, the back of the platform is raised, giving the platform an inclination forward of about 15 degrees. By pressing the lever arm to the left the front gear is again placed in position, and upon turning the handled wheel from you, the platform may be raised without disturbing the dip of the platform. If the handled wheel is turned toward you, the platform will be lowered without disturbing the dip of the platform.

Price of Equipment complete, ... $45.00.

For Sale by all Dealers, and...

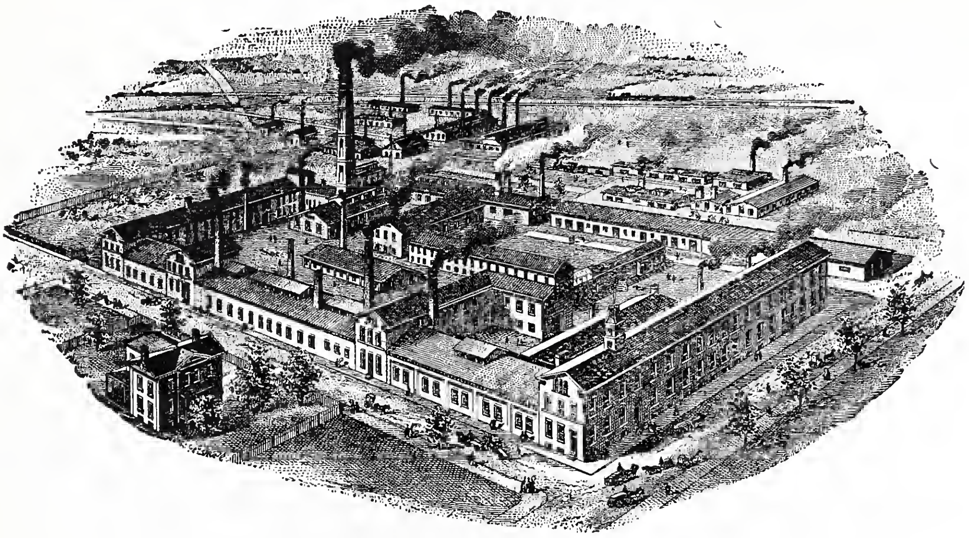
THE SCOVILL & ADAMS CO. OF N. Y.,
60 and 62 East 11th Street, NEW YORK.

CHAS. COOPER & CO.

ESTABLISHED 1857.

Manufacturing Chemists and Importers,

194 WORTH STREET,
NEW YORK.



WORKS AT NEWARK, NEW JERSEY.

Chemically Pure Photo Chemicals.

NITRATE SILVER, CHEMICALLY PURE CHLORIDE GOLD,
SULPHITE SODA CRYSTALS AND GRANULAR. : : : : :
: : LITMUS PAPER, ACID SULPHITE SODA SOLUTION,
COMMERCIAL AND CHEMICALLY PURE ACIDS, ETHERS
AQUA AMMONIA, SOLUBLE COTTON FOR COLLODION PAPER.

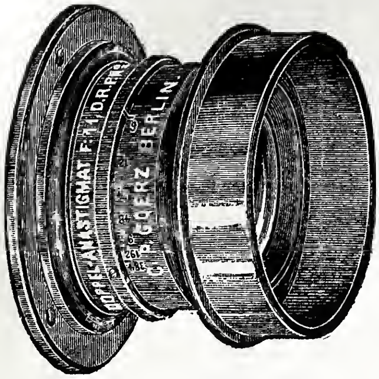
**We Manufacture a full line of Chemicals,
Medicinal, and for the Arts and Technical purposes.**

Bromo-Oxygen, a most efficient disinfectant and deodorizer. Can be diluted with 32 parts of water.

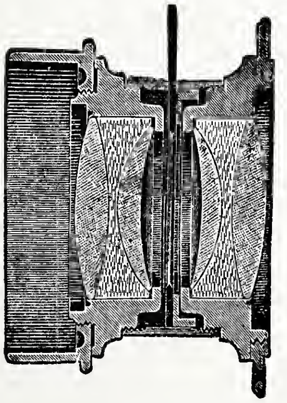
MONTHLY PRICE LIST ISSUED. **REFINERS OF PHOTO SILVER AND GOLD WASTE.**

CARDS FOR MOUNTING PHOTOGRAPHS.

A. M. Collins Manufacturing Co.
No. 527 Arch St. PHILADELPHIA.



German Patent No. 74,437.
American Patent No. 528,155.



TRY THE GOERZ

Double Anastigmat

Before Buying Another Lens.

It will give you better definition, greater depth of focus and more illumination, over the whole of your plate than any other lens on the market.

FOR SALE BY ALL DEALERS OR

C. P. GOERZ,

52 Union Square East, - - - NEW YORK.

Factory at Berlin (Germany).

A NEW CAMERA

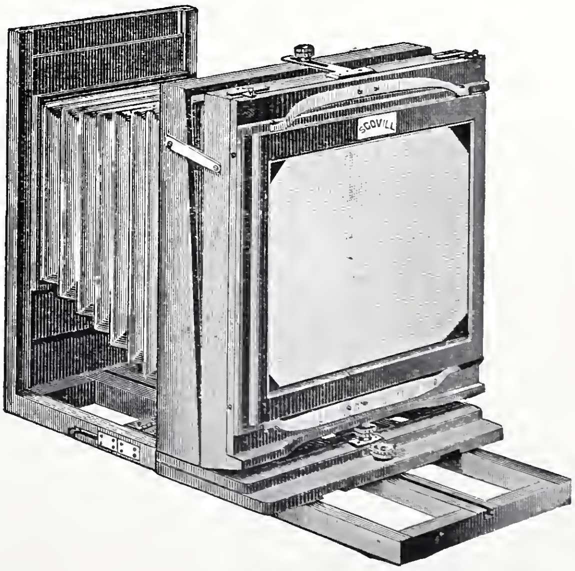
"The Reversible Landscape"

MADE BY THE AMERICAN OPTICAL CO.

To meet the demand for high-grade apparatus at popular prices. This camera is made of highly polished mahogany, with all the latest improvements, and patent self-adjusting ground glass frame, reversible back, and rising front.

PRICES:

6½ x 8½	Double Swing		$23.00
8 x 10	"	"	25.00
11 x 14	"	"	35.00
14 x 17	"	"	50.00



THE SCOVILL & ADAMS CO. OF N. Y., 60 and 62 East 11th Street.

The Scovill & Adams Co.

Of New York.

60 & 62 East Eleventh Street, N. Y.

Are Trade Agents for and Supply:

THE GOERZ (NEW) DOUBLE ANASTIGMAT LENSES (PATENTED).
THE MORRISON FAMOUS WIDE ANGLE LENSES.
THE CELEBRATED WATERBURY (SINGLE ACHROMATIC) LENSES.

⁂

THE AMERICAN OPTICAL COMPANY'S APPARATUS.
THE FLAMMANG-SCOVILL-LEVY SCREEN PLATE-HOLDERS (PATENTED).
ALL STANDARD PHOTO-ENGRAVING GOODS.
SCOVILL REVERSING APPARATUS.
SCOVILL THREE-COLOR SCREENS.

⁂

HAMMER DRY PLATES.
THREE CROWN ALBUMEN PAPER.
EMPIRE COLLODION GLOSS (ARISTOTYPE PAPER).
EMPIRE COLLODION MATT (ARISTOTYPE PAPER).
EMPIRE GELATINE (ARISTOTYPE PAPER).

⁂

"DIXEY" VIGNETTERS.
SCOVILL (PATENTED) ZINC ADJUSTABLE WASHING BOXES.
SCOVILL (PATENTED) MAGNESIUM CARTRIDGES.
THE "WORLD" SPECIAL PHOTO-FINISH BLOTTING PAPER.
"SWEETHEART" ADHESIVE CLOTH.

⁂

S. P. C. CHEMICALS AND PREPARATIONS.
MERCK'S PYRO.
"NON-COCKLE" MOUNTING PASTE.
REIFSCHNEIDER'S "ECLIPSE" AND "REGENT" ALBUMS.
WATERBURY CARDBOARD.

⁂

THE SCOVILL PHOTOGRAPHIC SERIES OF PUBLICATIONS.
THE AMERICAN ANNUAL OF PHOTOGRAPHY.
THE PHOTOGRAPHIC TIMES (MONTHLY).
THE PRACTICAL PROCESS WORKER (MONTHLY).
EL PROGRESO FOTOGRÁFICO (MONTHLY).

Descriptive Catalogues and Special Price Lists on application.

Correspondence Solicited

Capital is the important item of business success.

A PHOTOGRAPHER'S capital is the confidence of his patrons. This confidence is gained and retained by permanent photographs.

Permanent photographs depend largely on the paper used.

The leading and successful PHOTOGRAPHERS in this country use

AMERICAN

"ARISTO" PRODUCTS.

☞ *The Standard Brands.*

Empire Gelatine Paper

Empire Collodion Gloss

Empire Collodion Matt

(FOR CARBON OR PLATINA EFFECTS)

UNIFORM==RELIABLE

EVERY SHEET GUARANTEED

FOR SALE BY ALL THE TRADE.

Manufactured by the Empire Photo Paper Co.

The Scovill & Adams Company of N. Y.

TRADE AGENTS,

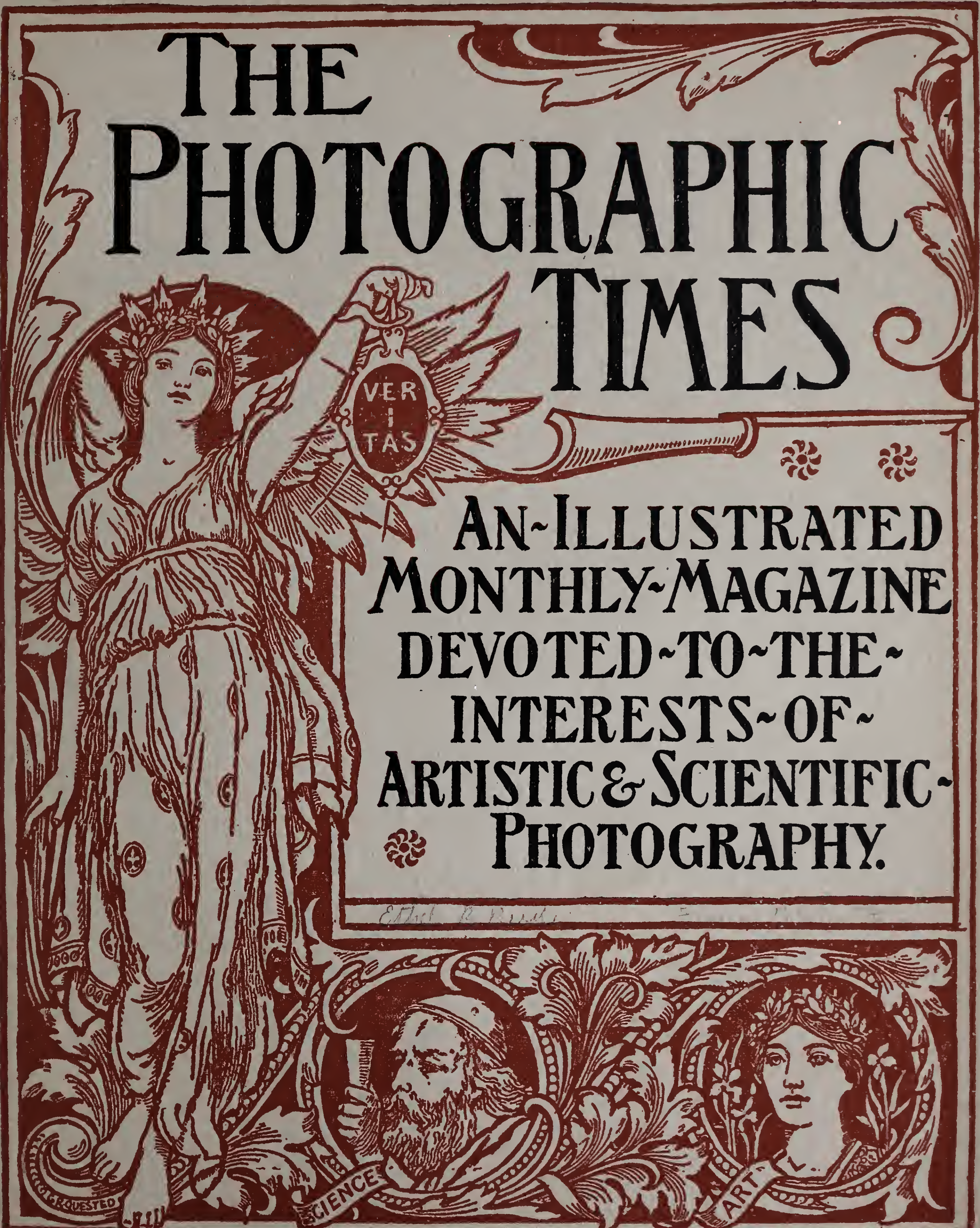
60 & 62 EAST ELEVENTH ST., - - NEW YORK, U. S. A.

☞ **ASK YOUR DEALER FOR IT.**

Vol. XXIX.
FOUR DOLLARS PER ANNUM.

NOVEMBER, 1897.

Number 11.
SINGLE COPIES, 35 CENTS.



THE PHOTOGRAPHIC TIMES

AN ILLUSTRATED MONTHLY MAGAZINE DEVOTED TO THE INTERESTS OF ARTISTIC & SCIENTIFIC PHOTOGRAPHY.

Ethel B. Rudd

THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION 60 AND 62 EAST 11TH. ST. NEW YORK.

CONTENTS.

PAGE
Frontispiece—Portrait of Ethel Reed—By Frances B. Johnson.
Autobiographical Sketches—By H. P. Robinson.... 496
The Parade—Leamington—Illustration—By H. P. Robinson.......... 406
Red Riding Hood—Illustration—By H. P. Robinson 499
My Photographic Van—Illustration—By H. P. Robinson.......... 501
Preparing Negatives for Slide-Making. By Ellerslie Wallace.......... 501
The Christmas Tree—Illustration—By T. Trowbridge.......... 502
Photographic Christmas Presents—By F. J. Burnett 502
Portrait Study—By Hollinger & Rockey.......... 503
Study—Illustration—By F. H. Day.......... 504
Facial Expressions—Illustrated—By Gilson Willett. 505
Films that Won't Curl, Simply Because They Can't—Illustrated—By Ottomar Jarecki.......... 507
A Tea Party—Illustration—By C. F. Jenkins.......... 508
The Daguerreotype—Illustrated—By Charles L. Lochman.......... 508
Crossing the Brook—Illustration—By Alfred Clements.......... 509
Photography, Painting, and Sculpture—By A. S. Southworth.......... 510
Portraits—By Reutlinger.......... 510
The Three-Color Process—The Yellow Negative—By P. C. Duchochois.......... 511
The Development of the Burnisher—Illustrated—By E. J. Prindle.......... 512
The Close of Day—Illustration—By L. V. Kupper.. 513
Toning With Metals other than Gold—By B. O. B.. 516
Outside the Sub-Treasury—Illustration—By W. H. Cooper.......... 517

PAGE
Finishing Negatives—By Chapman Jones.......... 518
On the Best Forms of Lens to Use for Portraiture—By W. K. Burton.......... 519
On the Hudson—Illustration—By Lydell Sawyer... 520
Landscape Study—Illustration—By Seymour Conway.......... 521
Action of the Bromide Retarder in Development—By C. Welborne Piper.......... 522
The Belle of Stamboul—Illustration—By Robert E. M. Bain.......... 523
A Daughter of the People—Illustration—By R. E. M. Bain.......... 523
Backed Plates.......... 524
In Daisy Time—Illustration—By Alfred Clements.. 525
Hints on Photographing Polished Surfaces.......... 525
The Tug of War.......... 525
On the Wandle—Illustration—By J. Carpenter.......... 526
Large or Small Size?.......... 527
Portrait Study—By Adolph Meyer.......... 529
A Sketch—Illustration—By Alfred Clements.......... 531
The Jolly Color Process.......... 531
The Washing of Gelatino-Chloride Prints—By A. V. Kenah.......... 532
The Use of the Swing-Back—A Chapter for Beginners—By Rev. A. H. Blake, M.A.......... 532
Platinum Printing on Fabrics, Platinum Toning, etc. By E. A. Robbins.......... 534
Sky and Landscape on One Plate—A Note for Young Workers—By W. Thomas.......... 535
Notes.......... 536
Jadis—Illustration—By Alfred Werner.....Opposite 537
Photographic Patents.......... 544
THE ENCYCLOPÆDIC DICTIONARY OF PHOTOGRAPHY.......... 353

The American Annual of Photography

...FOR...
1898

Edited by
WALTER E. WOODBURY

WILL BE
BIGGER
BRIGHTER
and more
BEAUTIFUL
than ever

60 FULL PAGE PICTURES
300 ILLUSTRATIONS IN ALL
A Great Number of Practical Articles by the Best Writers

1 Photogravure Frontispiece
3 Three-Color Pictures
1 Heliotype Reproduction
1 Two-Color Print
16 Inserts Printed in Colors.

PRICE:

In Paper Covers, -	$0.75
Cloth Bound, - - -	1.25
Additional for Postage,	.17

For Sale by all Dealers in Photographic Goods, and
The Scovill & Adams Co. of New York
60 and 62 EAST ELEVENTH STREET

THE GETTY CENTER
LIBRARY

"Sunlight and... Shadow"

A BOOK FOR PHOTOGRAPHERS,

.....AMATEUR AND PROFESSIONAL.....

By W. I. LINCOLN ADAMS.

Containing Chapters and Illustrations by such well-known photographic writers and workers as

H. P. ROBINSON,
A. HORSLEY HINTON,
W. B. POST,
B. J. FALK,
ALFRED STIEGLITZ.
R. EICKEMEYER, Jr.,
J. WELLS CHAMPNEY,
ALEXANDER BLACK,
W. A. FRASER,
HER GRACE THE DUCHESS OF SERMONETA,
and the MARQUIS DE ALFARRAS.

It covers the field entirely, as shown by the following

Contents

THE CHOICE OF SUBJECT.
LANDSCAPE WITHOUT FIGURES.
LANDSCAPE WITH FIGURES.
FOREGROUNDS.
THE SKY.
OUT-DOOR PORTRAITS AND GROUPS.
THE HAND CAMERA.
INSTANTANEOUS PHOTOGRAPHY.
WINTER PHOTOGRAPHY.
MARINES.
PHOTOGRAPHY AT NIGHT.
LIGHTING IN PORTRAITURE.
PHOTOGRAPHING CHILDREN.
ART IN GROUPING.

About 150 pages of the most instructive and entertaining reading matter,

....AND....

: : : : ***More than 100 Beautiful Photo Engravings*** : : : :

MANY OF THEM FULL-PAGE PICTURES.

Printed on Heavy Wood-cut Paper, with liberal margins and gilt edges.
Beautifully and Substantially bound in Art Canvas, with gilt design.

PRICE, IN A BOX $2.50

Sent post free by mail, to any address, on receipt of amount by

The Scovill & Adams Company of New York,

60 and 62 East Eleventh Street, New York City.

[OVER]

List of the Illustrations in Sunlight and Shadow.

In Prospect Park (Brooklyn)	W. I. Lincoln Adams.
By the River	A. L. Eidemiller.
Morning Mist	H. P. Robinson.
Day's Decline	A. Horsley Hinton.
Winter	W. H. Dodge.
The Jungfrau	Dr. J. Meiner.
On Lewes Creek	H. Troth.
Woods	P. Dementjeff.
By the Stream	E. B. Garrison.
The Jungfrau	Alfred Stieglitz.
In the Highlands	W. Dawes.
Landscape and Clouds	Arthur Burchett.
Shades of Evening	Her Grace the Duchess of Sermoneta
Returning from Market	Alfred Stieglitz.
An English Country Scene,	Seymour Conway.
Study of Fisherfolk	Miss K. G. Spink
A Sicilian Idyll	Count Von Gloeden.
Mending Nets (Katwyk)	Alfred Stieglitz.
Here Comes Father	Jesse Poundstone.
A Wet Day on Boulevard.	Alfred Stieglitz.
Foregrounds—Fig. 1	H. P. Robinson.
" Fig. 2	"
" Fig. 3	"
" Fig. 4.	"
" Fig. 5	"
" Fig. 6	"
The Sky—Fig. 1	"
" Fig. 2	"
" Fig. 3	"
" Fig. 4	"
" Fig. 5	"
" Fig. 6	"
Hilltop Farm	W. I. Lincoln Adams.
A Gutach Meeting	Alfred Stieglitz.
Intimate Friends	Mabel Osgood Wright.
An Alpine Cross	Alex. Keighley.
As She Comes Down the Stairs	R. Eickemeyer, Jr.
"What is Your Fortune, My Pretty Maid ?"	Major R. H. Brown,
"Nobody Axed You, Sir," she said	" " "
The Shepherd	H. K. Noyes.
"He Cometh Not," she said	R. Eickemeyer, Jr.
A Favorite Occupation, Venice	Alfred Stieglitz.
Winter, Fifth Avenue	"
A Blockade, New York	"
Wash-day, Venice	"
A Hot Day	"
In the Fields	"
A Bit Near Munich	"
A Venetian Well	"
A Venetian Bit	"
Venetian Characters	Alfred Stieglitz.
Katwyk Beach	"
Mid-ocean	"
The Diver	Louis Meldon.
Throwing the Hammer	
A Rise in the World	The Marquis de Alfarras
The Start	James Burton.
Jumping	
A Snap Shot	C. C. Langill.
A Reminiscence of Winter	W. I. Lincoln Adams
Under the Willows,	" "
A Country Lane in Winter	A. R. Dresser.
End of a Winter's Day	W. B. Post.
Frost Laden	Randall Spaulding.
Boston Public Garden	Newton W. Elwell.
A Winter Morning in Brookline	
A Rough Morning	Frank Hurndall.
Holy Loch	H. P. Robinson.
Mr. Gould's "Atlanta"	"
Valkyrie III, Ailsa, Britannia	"
Sky and Sea	"
Seagulls	"
On the Heatherbell	
Marine Study	J. M. Bemis.
Twilight, Mid-ocean	T. Frank Atkinson.
The Sea	Harry Platt,
By Bryant Park after the Storm	W. A. Fraser.
The Savoy Hotel, New York—Stormy Night	"
Entrance to Central Park	"
The Giant Hotels, from Central Park	"
Moonlight, Central Park	"
Study (from Recollections in a Mirror)	J. Wells Champney.
Portrait Studies	"
Isabel	B. J. Falk.
Minnie	"
Rosita	"
Rita	"
Little Tuesday	"
Childhood	"
Child Study	"
Reflections	"
Child Study	Fred. Boissonas.
Art in Grouping—No. 1	
" " No. 2	
" " No. 3	
" " No. 4	
" " No. 5	
" " No. 6	
Scene from "A Capital Courtship"	Alexander Black.

A Beautiful Gift Book for the Holidays. . . . . .

For Sale by all dealers in Photographic Supplies, Booksellers, etc.

Price, post free, in a box, $2.50.

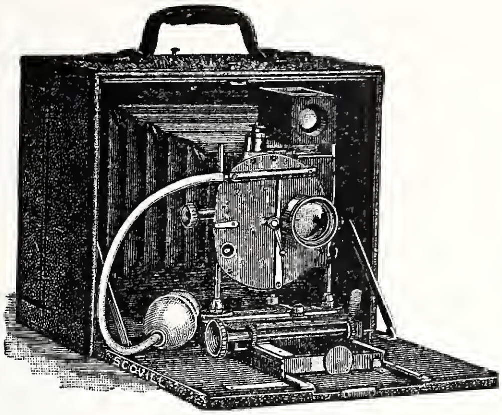
CAMERAS FOR NOTHING.

Our Special Offer.

TO ANYONE sending us twenty-five yearly subscriptions for this magazine we will give **Free of all charge** a beautiful 4 x 5 **Henry Clay Camera** complete with lens, shutter, etc,,

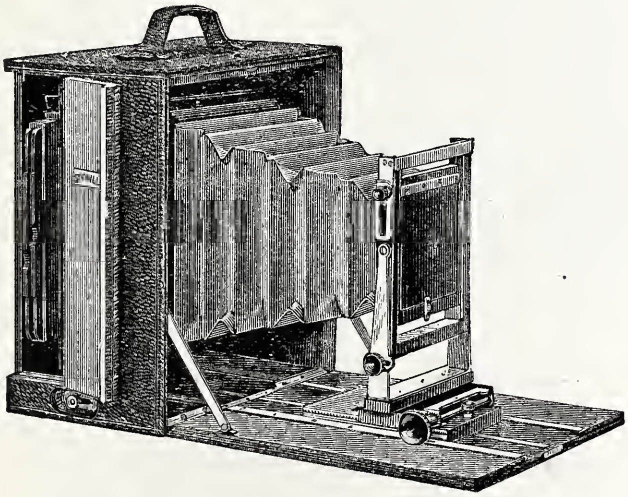
TO ANYONE sending us fifty yearly subscriptions to this magazine we will give **free of all charge** a magnificent 8 x 10 **Irving Clay Camera.**

BOTH these cameras are marvels of workmanship and the finest grade of apparatus manufactured by the American Optical Co.



4 x 5 Henry Clay Camera,

For 25 Subscriptions to The Photographic Times.



8 x 10 Irving Clay Camera,

For 50 Subscriptions to The Photographic Times.

Send in your subscriptions as you receive them and they will be credited to your account.

Each subscription must be accompanied with the cash in payment therefor.

Two half-year or four quarterly subscriptions will count as one year's.

Give full name and address of subscriber. One yearly subscription costs $4.00, half-yearly $2.00, and quarterly $1.00.

The Photographic Times Publishing Association,

60 and 62 East 11th Street, New York.

HAVE YOU SECURED A COPY?

The American Annual of Photography and Photographic Times Almanac for 1897

EDITED BY WALTER E. WOODBURY.

70 full-page Illustrations.

300 Pictures in all.

1 Photogravure Frontispiece.
3 Three-Color Pictures.
1 Heliotype Reproduction.
1 Two-Color Print.
16 Inserts Printed in Colors.

ECLIPSES THEM ALL.

A Giant in size, and a veritable storehouse of good things.

Price, in Paper Covers,	$0 75
" Cloth Bound,	1 25
Additional for Postage,	17

FOR SALE BY
The Scovill & Adams Co. of N. Y.
60 and 62 East 11th Street.

The S. & A. Photographic Series.

	Price per copy.
No. 1. The Photographic Amateur. By J. Traill Taylor. A Guide to the Young Photographer, either Professional or Amateur. (Second Edition.) Paper covers, 50 cents. Cloth bound (Library Edition)	$0 75
No. 5. Photography with Emulsions. By Capt. W. De W. Abney, R.E., F.R.S. A treatise on the theory and practical working of Gelatine and Collodion Emulsion Processes. (Second Edition.) Paper covers	75
No. 7. The Modern Practice of Retouching. As practiced by M. Piquepé, and other celebrated experts. (Ninth Edition.) Paper Covers	50
Cloth bound (Library Edition)	75
No. 8. The Spanish Edition of How to Make Pictures. Ligeras Lecciones sobre Fotografia Dedicados a Los Aficionados. Cloth bound, 75 cents. Paper covers	50
No. 12. Hardwich's Photographic Chemistry. A manual of photographic chemistry, theoretical and practical. Ninth Edition. Edited by J. Traill Taylor. Leatherette binding	2 00
No. 13. Twelve Elementary Lessons on Silver Printing. (Second Edition.) Paper covers	50
No. 14. About Photography and Photographers. A series of interesting essays for the studio and study, to which is added European Rambles with a Camera. By H. Baden Pritchard, F.C.S. Paper covers	50
Cloth bound (Library Edition)	75
No. 15. The Chemical Effect of the Spectrum. By Dr. J. M. Eder. Cloth bound, 50 cents. Paper covers,	25
No. 16. Picture Making by Photography. By H. P. Robinson. Author of Pictorial Effect in Photography. Written in popular form and finely illustrated. Library Edition, $1.00. Paper Covers	75
No. 20. Dry Plate Making for Amateurs. By George L. Sinclair, M.D. Pointed, practical and plain. Leatherette binding	50
No. 21. The American Annual of Photography and Photographic Times Almanac for 1887. (Second Edition.) Paper cover; (postage, 12 cents additional)	50
Library Edition; (postage, 12 cents additional)	1 00
No. 22. Photographic Printing Methods. By the Rev. W. H. Burbank. A Practical Guide to the Professional and Amateur Worker. Cloth bound. (Third Edition)	1 00
No. 23. A History of Photography. Written as a practical guide and an introduction to its latest developments. By W. Jerome Harrison, F.G.S., and containing a frontispiece of the author. Cloth bound	1 00
No. 24. The American Annual of Photography and Photographic Times Almanac for 1888. Illustrated. (Second Edition.) Paper; (by mail, 12 cents additional.)	50
Library Edition; (by mail, 12 cents additional)	1 00
No. 25. The Photographic Negative. A Practical Guide to the Preparation of Sensitive Surfaces by the Calotype, Albumen, Collodion, and Gelatine Processes, on Glass and Paper, with Supplementary Chapter on Development, etc., by the Rev. W. H. Burbank. Cloth bound. Reduced from $1.50 to	1 00
No. 26. The Photographic Instructor for the Professional and Amateur. Being the comprehensive series of Practical Lessons issued to the Students of the Chautauqua School of Photography. Revised and enlarged. Edited by W. I. Lincoln Adams, with an Appendix by Prof. Charles Ehrmann. (Fifth Edition, enlarged and revised.) Paper Covers $1.00. Library Edition	1 50
No. 27. Letters on Landscape Photography. By H. P. Robinson. Finely illustrated from the Author's own photographs and containing a Photogravure Frontispiece of the Author. Cloth bound	1 50
No. 29. The Processes of Pure Photography. By W. K. Burton and Andrew Pringle. A standard work, very complete and freely illustrated. Price, in paper covers, $2.00. Library Edition	2 50
No. 30. Pictorial Effect in Photography. By H. P. Robinson. A new edition. Illustrated. Mr. Robinson's first and best work. Cloth bound	1 50
No. 32. Practical Photo-Micrography. By Andrew Pringle. Fully illustrated. Cloth bound	$2 50

The S. & A. Photographic Series.

(Continued.)

	Price per copy.
No. 33. The American Annual of Photography and Photographic Times Almanac for 1890.	
Paper cover (by mail, 14 cents additional)	50
Library Edition (by mail, 14 cents additional)	1 00
No. 34. The Optical Lantern. Illustrated. By ANDREW PRINGLE. In paper covers	1 00
Cloth bound	1 50
No. 35. Lantern-Slides by Photographic Methods. By ANDREW PRINGLE. In paper covers	75
Cloth bound	1 25
No. 36. The American Annual of Photography and Photographic Times Almanac for 1891.	
Paper cover (by mail, 15 cents additional)	50
Library Edition (by mail, 15 cents additional)	1 00
Cyclopedic Index for 1891 Annual	10
No. 37. Photographic Optics. A Text Book for the Professional and Amateur. By W. K. BURTON. Paper	1 00
Library Edition	1 50
No. 38.—Photographic Reproduction Processes. Illustrated. By P. C. DUCHOCHOIS. Paper	1 00
Cloth	1 50
No. 39. El Instructor Fotografico. Paper covers, $1.00 Library edition	1 50
No. 41. The Chemistry of Photography. By W. JEROME HARRISON. Cloth bound	3 00
No. 42. Picture-Making in the Studio. By H. P. ROBINSON. Paper	50
Cloth bound (Library edition)	1 00
No. 43. The American Annual of Photography and Photographic Times Almanac for 1893.	
In Paper covers. Postage, 15 cents extra	50
Cloth bound (Library edition). Postage 15 cents extra	1 00
No. 44. The Lighting in the Photographic Studio. By P. C. DUCHOCHOIS. A new edition. In paper covers	75
Cloth bound (Library edition)	1 00
No. 45. The Grammar of Photo-Engraving. By H. D. FARQUHAR. Illustrated. The most complete text book yet published on this subject. Price, in paper covers	2 00
Cloth bound (Library edition)	2 50
No. 46. Industrial Photography. Illustrated. By P. C. DUCHOCHOIS. Being a description of the various processes of producing Indestructible Photographic Images on Glass, Porcelain, Metal, and many other substances. Paper Covers, 50 cents. Cloth bound	1 00
No. 47. The American Annual of Photography and Photographic Times Almanac for 1894. Edited by W. I. LINCOLN ADAMS. In Paper Covers. Postage, 15 cents extra	50
Cloth bound (Library Edition). Postage, 15 cents extra	1 00
No. 48. Aristotypes, and How to Make Them. Giving a complete description of the manufacture and treatment of Gelatino and Collodio-Chloride Papers. By WALTER E. WOODBURY. Illustrated. In Paper Covers	1 50
Cloth bound (Library edition)	2 00
No. 49. The Encyclopedic Dictionary of Photography. Containing over 2,000 references and about 400 illustrations. By WALTER E. WOODBURY, Editor of THE PHOTOGRAPHIC TIMES. In press.	
No. 50. The American Annual of Photography and Photographic Times Almanac for 1895. With over 200 illustrations. Edited by WALTER E. WOODBURY, Editor of "The Photographic Times." In Paper Covers. Postage, 15 cents extra	50
Cloth bound (Library Edition)	1 00
No. 51. The Photo-Gravure. By HENRY R. BLANEY. A very complete and practical book, written by an Expert. In paper covers, 50 cents. Cloth bound (Library edition)	1 00
No. 52. The Platinotype: Its Preparation and Manipulation. By Capt. W. DE W. ABNEY & LYONEL CLARK. Fully illustrated. 174 pages	1 25
No. 53. The Annual, '96. "The American Annual of Photography and Photographic Times Almanac for 1896," with 400 illustrations. Edited by WALTER E. WOODBURY, Editor of THE PHOTOGRAPHIC TIMES. In paper cover, 75 cents; in cloth bound	1 25
No. 54. Half-Tone by the Enamel Process. By ROBERT WHITTET. Fully illustrated and very complete. Price, in pape cover, 50 cents. Library edition	1 00
No. 55. Instantaneous Photography. By Capt. Abney, the great authority. Price in paper covers	75

For sale by all dealers in Photographic goods, booksellers, and sent, postpaid, on receipt of price, by the publishers.

No. 56. Photographic Amusements. By WALTER E. WOODBURY, Editor of THE PHOTOGRAPHIC TIMES In paper covers	1 00

THE SCOVILL & ADAMS CO. OF NEW YORK,

60 and 62 East 11th Street, New York.

A Selected List of Books

From the Scovill & Adams Co. of New York Book Catalogue.

	Price per copy
Amateur Photography. A Practical Guide for the Beginner. By W. I. Lincoln Adams. Illustrated. Paper covers, 50c.; cloth bound	$1 00
Lantern Slides and How to Make Them. By A. R. Dresser. A new book, very complete and practical	25
Photography at Night. By P. C. Duchochois. Illustrated. 108 pp. Paper covers	1 00
The Knack. Written expressly to help the beginner in perplexity, reduced to	25
Photographic Lenses; Their Choice and Use. By J. H. Dallmeyer. A special edition, edited for American photographers. In paper covers	25
The Chemistry of Photography. By Prof. Raphael Meldola	2 00
The Photographic Image. By P. C. Duchochois. A Theoretical and Practical Treatise on Development. Paper covers Cloth bound	1 50 2 00
The Ferrotyper's Guide. For the ferrotyper, this is the only standard work. Seventh thousand	75
The Photographic Studios of Europe. By H. Baden Pritchard, F.C.S. Cloth bound, $1.00; paper covers	50
History and Hand-Book of Photography. With seventy illustrations. Cloth bound, reduced to	50
Crayon Portraiture. Complete instructions for making Crayon Portraits on Crayon Paper and on Platinum, Silver and Bromide Enlargements; also directions for the use of Transparent Liquid Water Colors, and for making French Crystals. By J. A. Barhydt. A new edition. Paper covers Cloth bound	 1 00
Art Recreations. Ladies' popular guide in home decorative work, with a chapter on photography. Edited by Marion Kemble	1 00
American Carbon Manual. For those who want to try the carbon printing process, this work gives the most detailed information. Cloth bound. Reduced to	50
The Photographer's Book of Practical Formulas. Compiled by Dr. W. D. Holmes, Ph.B., and E. P. Griswold. Paper covers, reduced from 75c. to 30c.; cloth bound, reduced from $1.50 to	60
American Hand-Book of the Daguerrotype. By S. D. Humphrey. (Fifth Edition) This book contains the various processes employed in taking heliographic impressions	25

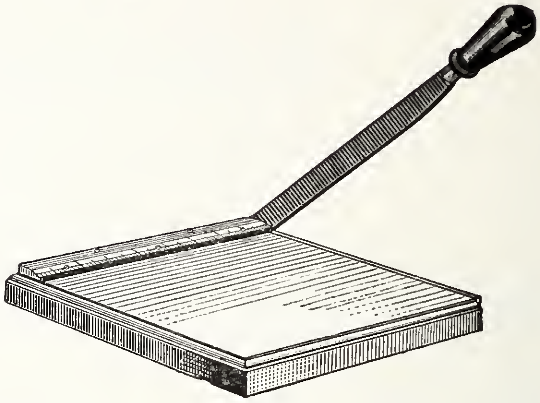
Simplex Print Trimmer.

* * *

Cheaper than any other.

Better than all the others.

* * *



In the manufacture of this Trimmer we have given special attention to the knives, with the result that they are more evenly tempered, and better adjusted than those costing double.

COMPARE OUR PRICES WITH ALL THE OTHERS.

No. 0. 7 inch blade	*$2 00.*
No. 1. 8½ inch blade	*2 25.*
No. 2. 10 inch blade	*2 50.*

Discount to the trade upon application to

THE SCOVILL & ADAMS CO. OF NEW YORK,

60 and 62 East 11th Street.

ARE YOU A SUBSCRIBER

TO THE

St. Louis & Canadian Photographer?

NO?

WELL, YOU ARE BEHIND THE TIMES.

Send 50 Cents at once for a

3 MONTHS' TRIAL TRIP.

EVERY NUMBER HANDSOMELY ILLUSTRATED.

Amateurs like it. Professionals cannot do without it.

"I wish you success in the new Editorship, and hope that the good work of the Journal will go on, and that it will still continue to uphold and build up the legitimate photo business."

C. P. McDANNELL,
Cambridgeboro, Pa.

"Why, of course, we wish to renew. You would not expect us to try and run business without it."

E. LONG & SON,
Quincy, Ill

$3.00 per Year, $1.50 for Six Months.

Mrs. FITZGIBBON-CLARK,

2714 Olive St., ST. LOUIS, MO.

SUBSCRIPTIONS RECEIVED BY ALL DEALERS.

THE

Year Book of Photography and Amateur's Holiday Guide,

PRICE, IN PAPER COVERS,	$0.50
CLOTH BOUND,	1.00

A limited number only imported : : : : : : : :

Order now, if you want a copy.

The Scovill & Adams Co. of N. Y

"Roentgen Rays" seem to be developing a sense of humor in the German photographic brain. The *Photographisches Wochenblatt* gives the following forecast of professional photography in 1897:

Scene—Photographer's reception room.
Customer—"I should like to be photographed."
Lady Attendant—"An exterior or interior view?"
Customer—"Only the spleen, if you please."
Lady Attendant (through the telephone): "Take one Central interior!! Bile sensitive plate!!!"

Amateur Photography.

"A Practical Guide for the Beginner."

BY W. I. LINCOLN ADAMS.
(ILLUSTRATED.)

This is a practical treatise for the beginner by one whose experience of, and immediate contact with, the needs of those who are using the camera, in and out of doors, both for pleasure and profit, especially fits him to HELP THE BEGINNER.

It will be sent, post-paid, in paper covers on receipt of Fifty Cents.

In handsome Red Cloth Binding, with Gilt Lettering. One Dollar.

GET THE PERMANENT CLOTH BINDING.

This Book is now in its Third Edition and Sitxh Thousand. You cannot afford to be without it.

THE SCOVILL & ADAMS COMPANY OF N. Y.

Short Stories.

One of the most Entertaining
Periodicals Published.

BRIGHT. ***SPICY.***

Just the thing for the Traveler and Summer
Resorter or the Hearth-Stone in Mid-Winter.

ALWAYS REFRESHING.

Advertisers reap great benefits from it and express unbounded satisfaction at the results of using its columns.

25 Cents a Copy on all News Stands.

Bryant Building, - 55 Liberty Street, - New York.

A Sample Copy Free if Advertisement is mentioned.

Learn how to make

Your own Engravings.

THE LATEST BOOK OUT.

Half Tone by the ENAMEL PROCESS

Tells all about it.

Price, 50 cents, paper cover.

The Scovill & Adams Co. of N. Y.

60 and 62 East 11th St., N. Y. City.

The Practical Process Worker and Photo-Mechanical Printer.

A Representative Monthly Magazine of American Process Work.

Fully Illustrated with Specimens of the Latest Achievements in the Art.

This periodical is conducted by practical men, who give their experience in the laboratory and workshop, not by mere theorists.

Subscription price per annum, 50 cents.
Single Copies, - - - 5 "

ADVERTISING RATES ON APPLICATION.

EDITED BY WALTER E. WOODBURY.
A. C. LAMOUTTE, BUSINESS MANAGER.

PUBLISHED BY The Scovill & Adams Co. of N. Y.,
60 & 62 East 11th Street, New York.

First Edition Sold Out within a few weeks.

SECOND EDITION NOW READY.

"Photographic Amusements"

By WALTER E. WOODBURY,
Editor of "The Photographic Times."
and "The American Annual of Photography."

Containing a Description of

A Number of Photographic Experiments and Novel Effects to be obtained with the Camera.

Invaluable to both the Amateur and Professional Photographer.

CONTENTS.

The Mirror and the Camera.
The Photo-Anamorphosis.
Statuette Portraits.
Magic Photographs.
Spirit Photography.
Photography for Household Decoration.
Leaf Prints.
To Make a Pen and Ink Sketch from a Photograph.
Photographs on Silk.
Photographs on Various Fabrics.
Photographs in any Color.
How to Copy Drawings.
Dry-Plates that Will Develop with Water.
Photographing the Invisible.
How to Make Photographs in a Bottle.
Caricature Photographs.
Photographing a Catastrophe.
Sympathetic Photographs.
Wide-Angle Studies.
Silhouettes.
Freak Pictures with a Black Background.
Freak Pictures by Successive Exposures.
Photographing Snow and Ice Crystals.
Photographing Ink Crystals.
Photographing Sea Weed.
Stamp Portraits.
Moonlight Pictures.
Floral Photography.
A Simple Method of Enlarging.
Distorted Images.
Luminous Photographs.
Photographs Without Light.
Electric Photographs.
Pinhole Photography.
Magic Vignettes.
Instantaneous Photography.
Photographing Fireworks.
Lightning Pictures.
The Photochromoscope.
Composite Photography.
Double Exposure Pictures.
Tele-photographs.
Artificial Mirages.
Etc., etc., etc.

OVER ONE HUNDRED ILLUSTRATIONS.

Price, in Paper Covers, $1.00. Cloth, $1.50.

Sent post-paid on receipt of price by the Publishers,

THE SCOVILL & ADAMS COMPANY OF NEW YORK,
60 and 62 East Eleventh St., New York, N. Y.

SEND FOR NEW CATALOGUE OF PHOTOGRAPHIC PUBLICATIONS.

SUBSCRIPTION FORM.

THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION,
60 and 62 East 11th Street, New York,
Gentlemen: Please send THE PHOTOGRAPHIC TIMES

for.................... year, commencing.................... 189 , for which

I enclose.................... dollars.

Name....................

Address....................

....

The Leading Photographic Magazine of the World.

TERMS CASH.—To avoid all risks, we prefer remittances by Express, Money Orders, Draft on New York, Post Office Money Orders, Postal Notes, or Registered Letter.

WILSON'S PHOTOGRAPHIC PUBLICATIONS.

WILSON'S PHOTOGRAPHIC MAGAZINE

A monthly technical journal for all interested in photography and its applications. Full of practical information, reliable formulæ, news of recent methods and processes. Brightly written and profusely illustrated. Independent and progressive in opinion. Price, Three Dollars per year; 1.50 for six months. Sample copy, 10c.

WILSON'S QUARTER CENTURY IN PHOTOGRAPHY. (Sixth Thousand.)

A complete text-book of the art, science and practice of photography and modern photographic processes. The departments given to lenses, studio construction, negative making and printing, are especially valuable. 528 pages; profusely illustrated; with index. Price, $4.00, postage paid. Contents list free.

WILSON'S CYCLOPÆDIC PHOTOGRAPHY. (Third Thousand.)

A universal photographic reference book, giving concise and reliable information upon all photographic subjects from the beginning down to date. 500 pages. Price, $4.00 postpaid. Send for special circular.

WILSON'S PHOTOGRAPHICS. (Ninth Thousand.)

This work, of which 8,000 copies have been sold, contains chapters upon every department of photographic practice, and includes a complete manual of the wet collodion process, as well as the "dry." Fully illustrated. Indispensable to photo-mechanical process-workers. 350 pages. Price, $4.00, postpaid. Detailed contents list free.

WILKINSON'S PHOTO-ENGRAVING, PHOTO-ETCHING Etc.

☞ The standard work on photo-mechanical methods; gives full instructions and formulæ, the equipment of the photographic department, process photography, etc. 180 pages; index. Price, $3.00, prepaid. Detailed contents list free.

PHOTOGRAPHIC MOSAICS 1897.

An illustrated annual record of photographic progress. Thirty-third year. Profusely illustrated Send for detailed contents list. Ready December 1, 1896.

EDWARD L. WILSON, 853 BROADWAY, NEW YORK.

THE ENCYCLOPAEDIC DICTIONARY OF PHOTOGRAPHY

which is continued in this issue, was commenced in the number for January, 1896, vol. xxviii, bound in cloth, and contains the encyclopædia up to date. Will be sent on receipt of Five dollars by

The Photographic Times Publishing Association,
60 and 62 East 11th St., New York.

MISSOURI PACIFIC RAILWAY

THE FAST MAIL ROUTE

ST. LOUIS TO KANSAS CITY
AND THE
WEST

HOURS SAVED TO SOUTHWEST MISSOURI AND KANSAS POINTS
WITH DIRECT CONNECTIONS FOR
COLORADO AND PACIFIC COAST POINTS
"THE COLORADO SHORT LINE"

C. G. WARNER, Vice-Pres't.
W. B. DODDRIDGE, General Manager
H. C. TOWNSEND, Gen'l Pass'r and Ticket Agent
St. Louis Mo

Read

"Electricity,"

The Only Independent Electrical Journal
Published in the United States.

ALL THE ELECTRICAL and FINANCIAL NEWS.

Latest Technical Articles by
Home and Foreign Writers.

THE BEST ADVERTISING MEDIUM.

Published Weekly.
Subscription $2.50 per year. Address,

ELECTRICITY NEWSPAPER CO.,
136 Liberty St., New York.

EVERY GOOD PHOTOGRAPHER

Delights in good printing. Send for a copy of *The Printer and Bookmaker*, a journal devoted to Printing, Engraving, Illustrating, Bookmaking, Etc. It is pleasing to the eye, and instructive to the mind.

SUBSCRIPTION PRICE, $2.00 PER YEAR.

HOWARD LOCKWOOD & CO.,
143 Bleecker Street, New York.

UNDER NEW MANAGEMENT.

ROMANCE

20 ROMANTIC STORIES FOR 10c.

MORE READING MATTER THAN ANY OTHER MAGAZINE IN THE WORLD.

A LIBRARY IN ITSELF.

Romances of Love and War, Romances of Real Life, Stories of Gallantry, Tales of Adventure, Stories of the Boudoir.

BEST KNOWN AUTHORS AND UNKNOWN AUTHORS.

SUBSCRIPTION $1.00 A YEAR

OR,

Romance and any $1.00 a year Magazine, $1.50.

EXTRAORDINARY PRICES OFFERS.

Bicycles given away. Particulars and Sample Copies Free.

GILSON WILLETS, Editor and Publisher,
1440 Broadway, New York.

Cameras

The Gameland Publishing Company, Incorporated, 63 Rutgers Slip New York, N. Y., will give a large number of cameras to those persons who send to them lists containing the greatest number of words formed from the letters in the word "CAMERAS". The prizes range from $75 Folding Kodaks to pocket cameras. All competitors must send $1 with their lists for one year's subscription to GAMELAND. Contest closes February 15th, 1898. Sample copy of GAMELAND, containing full particulars of contest,

Free.

INTERESTED IN ELECTRICITY?

Read The Electrical Engineer.

Published Weekly. Fully Illustrated. Convenient in Size.

ALL THE NEWS.

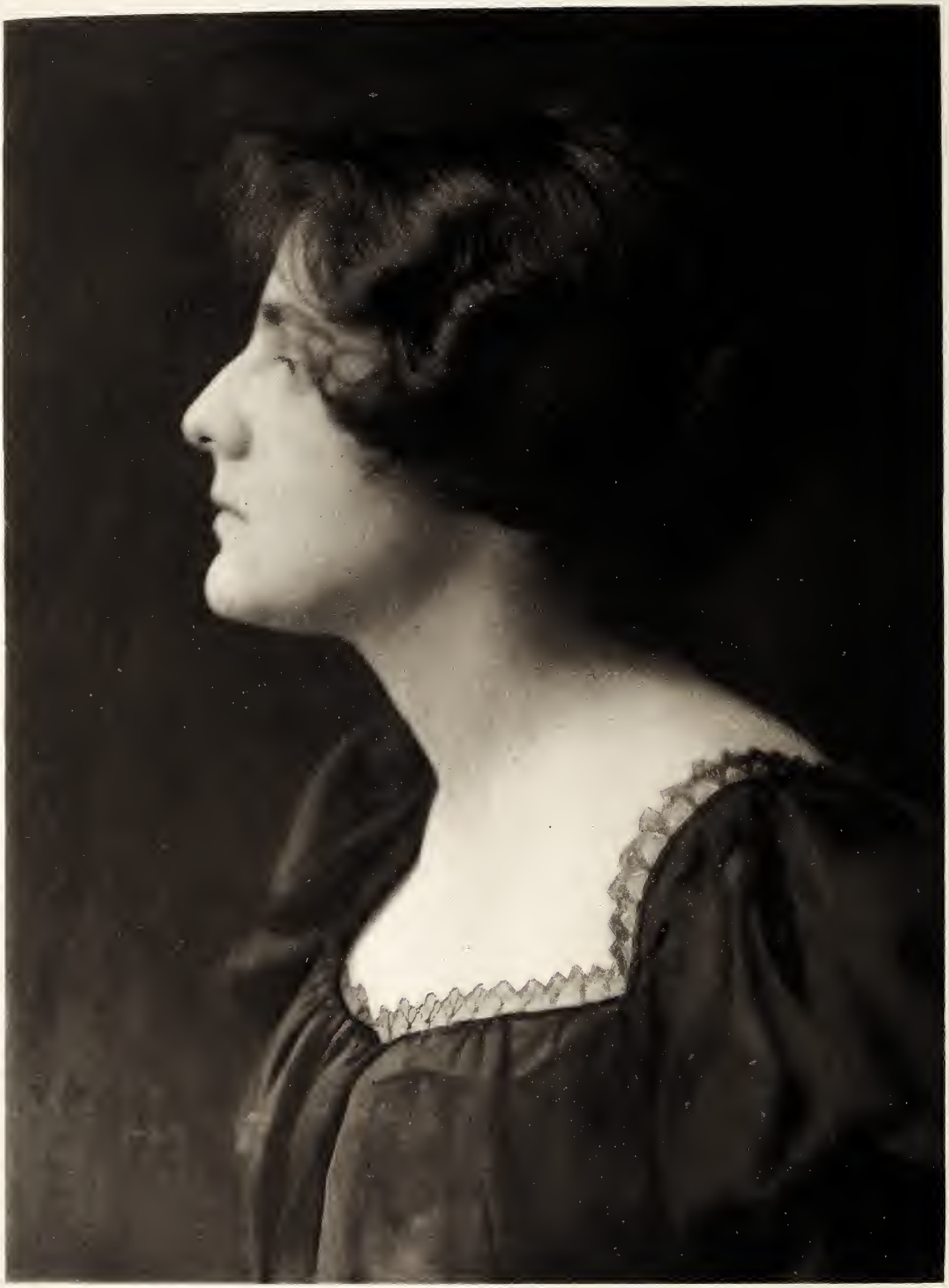
A series of important articles on the Storage Battery is now running in our pages.

Electrical Engineering Leaflets.

An educational electrical work in three volumes—elementary, intermediate, and advanced grades. $1.50 each.

THE ELECTRICAL ENGINEER,

SEND FOR BOOK CATALOGUE. 120 Liberty St., New York.



PHOTOGRAVURE BY WM SARTAIN & CO.

PORTRAIT OF ETHEL REED.
BY FRANCES B. JOHNSTON.

THE PHOTOGRAPHIC TIMES.

Vol. XXIX. NOVEMBER, 1897. No. 11.

AUTOBIOGRAPHICAL SKETCHES.

CHAPTER V.

BY H. P. ROBINSON.

> "When fortune means to man most good
> She looks upon him with a threatening eye."—Shakespeare.

THE PARADE, LEAMINGTON.

AT THE beginning of 1857 professional establishments were rapidly increasing in London, and more slowly in the country. In London the studio was at the top of the house, in the country in the garden; both were approached through a hall or passage in which were the show-cases. I cannot remember any photographer at that time who thought it necessary to make the splendid shop-window displays one now sees; paper pictures were the exception rather than the rule, and the evolution of portraiture was in the collodion positive stage.

It must be remembered that all this time I had little or no more money than was required for ordinary needs, and a house could not be taken or a studio built, nor furniture and apparatus bought without money. Worse than all, my friends thought me mad to give up a good business for what was looked upon as a very doubtful method of making a living. One friend would lend me a large sum to go into any other business, but not a penny towards photography; but, to shorten this part of this little history, one of my old Ludlow patrons heard of my difficulty, and quite unexpectedly lent me £100, very much less than it would be thought possible to do with under the same conditions nowadays Now began the only real business struggle I ever had in my life, and it was fierce while it lasted. Perhaps I should not have the courage to refer to it, if I did not think the contemplation of my misfortunes and how they ended, may revive hope in those who may have the mishap to meet with similar difficulties. It is surely good for all of us that we should not have it all our own way from birth to death.

I was not badly equipped, except with cash, for going into business. I knew something of business methods to begin with, and by this time I had had more or less practice in most of the graphic arts: oil and water-color painting, scene painting, miniature painting, pastel, chalk and pencil drawing, wood engraving, etching, aquatint, mezzotint, and lithography, and nearly all the processes of photography then invented, and was able to look at the press processes from the printer's practical point of view, in addition to energy that it appals me to remember, and my wife still occasionally reminds me that I told her gravely when we were married, that it must be "photography first, wife afterwards!"

On the strength of that hundred pounds and a very little more I had saved, I took a house in the best part of the Parade at Leamington at £80 a year, built a studio in the garden, and opened the show on January 12th, 1857. We made but a meagre display, a few poor portraits taken out of doors, and some local views, but

Copyright, 1896, by The Scovill & Adams Co. of New York. Entered as Second Class Matter at the New York, N. Y., Post Office.

the portraits were a novelty, nothing had been seen like them in the town before; there was only one other professional and he did nothing but positives on glass. Many people came to look at the show from the outside, but nobody came in, except intimate friends, for a week. At last, we had some genuine sitters. A lady and her two daughters came for a whole plate group. And now a strange thing happened to me. I was struck with what I can only call studio fright. I was "sitter shy." I could not face them. I ran away and took some time to recover my nerves. However, after a time I pulled myself together and managed to succeed in making a satisfactory group. This indicated a difficulty I had to study and correct, and it has not troubled me much since, although, even of late years, I meet at rare intervals with sitters I feel I would give the world to avoid, but have only once given up a sitter because I didn't like his looks, although I have turned out several for not conforming to the rule that no smoking was allowed, and for too exuberant spirits.

From the time I had commenced experimenting I had never had much difficulty with the process, but I had had no experience in the winter. Soon after I commenced, however, I met with all sorts of difficulties, chiefly from cold. Then came a great frost. The studio was attempted to be heated by a coke stove, which caused its own faults. Baths froze, bottles burst, collodion would not work or was very slow when prepared in a nitrate of silver bath near freezing point. One day I had an important sitter (it was Mr. John Laird, the famous ship-builder of Birkenhead), coming for an expensive colored portrait. The studio was dreadfully cold, and I piled up the fire and was called away. On my return I found the whole place on fire. The cocoanut matting of the floor and the wooden platform was burnt out; fortunately there was not much furniture to burn, and the camera escaped with a scorching. The fire was soon got under, but in putting it out we converted the studio into a beautiful grotto of icicles which was not helpful to photography. However, we soon got things to rights, but I obtained a good negative of Mr. Laird, who was one of my earliest and best patrons, and I had the pleasure of telling him some years afterwards that the good order from the negative had, probably, saved the whole concern.

In March of this first year I did three pictures for exhibition. They were of a theatrical subject, "Mr. Werner as Richelieu"; and were exhibited at the Manchester Art Treasures Exhibition, one of the finest exhibitions of painting that has ever been seen in this country It was in this exhibition that Rejlander's "Two Ways of Life" was first seen. My Richelieu was desperately bad. If we are to believe in his costume as shown in the photograph, the Cardinal dressed in crochet work antimacassars. I have a copy before me as I write. Before the end of the year I had produced a little picture of "Juliet with the Poison" that pleased me much better, and was the first of a series of whole plate pictures that were in the exhibitions for two or three years.

One of the difficulties of photography in early collodion days was getting any two samples of material to act alike. Collodion was peculiarly liable to depart from uniformity. It was difficult to obtain a collodion that would give a vigorous image, then it was decided by the chemists that their aim should be a collodion that would develop in the high-lights "as black as your hat, sir." It was useless for an artist to protest that he would prefer soft pictures, what did he know about it, did he invent photography? This idea was unfortunately fostered by the greatest chemist who occupied himself with the art, J. F. Hardwich. He advocated the use of iodized-collodion to the exclusion of bromide, and thereby got dense negatives. Photographers had to believe and follow the greatest authorities in those days; they were not allowed to have a will of their own. This was particularly the case with the camera makers, who insisted in using the heaviest materials, and solid workmanship, Spanish mahogany for cameras and strong oak for printing frames. About this time I had some 18 x 16 printing frames made of pine, by a common carpenter, and some of oak by the best maker. They are all in use at the present time, and those made of pine are in the best condition, and by far the most convenient to use.

The weight and inconvenience of the wet process for landscape work were so enormous that the photographic world for years before and after this date was hard at work endeavoring to invent dry processes that could enable the operator to get rid of the incumbrance. The dry processes were to the photographer of the day what the developer was to those of a few years ago, everybody had got a brand new one, or a modification of an old one.

I, of course, did as others did. I greatly simplified the Collodion Albumen Process, and wrote a paper on the subject which was published in the journal of the society, my first appearance in a photographic paper. I also published a guinea book entitled "Warwickshire Illustrated, a History of Remarkable Places in the County of Warwick," illustrated by a series of photographic views, by the Collodion Albumen Process. There was an astonishing two column laudatory review of the book in the *Athenæum*, (which journal has taken it out of me occasionally since), and it rather more than paid expenses. The views could not be said to be as good as they would have been by the wet process, and a year afterwards, when things were looking up, I started a pony and van with the aid of which I secured a fine collection of negatives of the lovely scenery around Leamington, Warwick, Kenilworth and Stratford on-Avon, and all within reach.

RED RIDING HOOD BY H. P. ROBINSON

During this first year sitters were few and far between, and for one month during the best of the season not one came near us. We struggled on, however, by the help of local views, and stereoscopic slides. In the spring of 1858 I considered the case hopeless and advertised the business for sale. Several people came to see it, but nobody would buy, although I was ready to almost give it away so that I could get rid of the responsibility. In April after some preliminary studies I took the negatives of "Fading Away," and after two months' work at them succeeded in getting a good print. This picture was produced with materials of my own preparation, from the collodion and nitrate of silver to the albumenized paper and chloride of gold. I should not be ashamed of the manipulation now, and the three copies I still possess are as perfect and fresh as they were thirty-nine years ago. Fading came in with a desire for more glaze. Albumen had to be sophisticated to satisfy the demand, the result we all know.

The production of this picture had a surprising effect on my fortunes. For two or three years Dr. Diamond had introduced me to his friends (he was a bit of a humorist) as the "coming photographer;" this was always taken as a joke, but this picture seemed to confirm the semi-prophesy. A copy was shown at the doctor's house, and his numerous, literary, and artistic friends were as much surprised as the present *Daily Chronicle* critic would be at any photograph that would compel him to confess that it was a work of art. The difference between then and now was that there was not so much ignorance, real or pretended, as we have now. Everybody admitted that a picture, in whatever material that could play on the emotions and draw tears, must be a work of art. The picture was first shown at a dinner at "Our Club" (a club instituted by Douglas Jerrold) and noticed by Shadbolt in the *Liverpool Photographic Journal* (now the *British*) of June 15th, 1858. The exhibition of the Photographic Society was about to open, and I took a copy there, but was a day too day late. The secretary of the time was an unsympathetic chemist (afterwards a famous savant), and all he could see in the picture was what he thought was a join, an imaginary enormity which afforded a text on which he waxed eloquent. He rejected the picture on the ground that it was too late. This was a valuable lesson to me. During the following thirty years I have saved many a photographer, and to some extent the society, from the horrors of red tape.

The picture was first seen publicly at the Crystal Palace in the autumn, and immediately afterwards at the Leeds Exhibition in connection with the British Association.

Being personally interested, and taking to my assistance all the assurance and forgetfulness of modesty that goes to the writing of an autobiography, I find it impossible to give any adequate impression of the reception of "Fading away" by the public. I have a large volume of newspaper cuttings, as well as many very painful letters and long poems from families who were losing one of their number, for the dying girl seem to be like every other young girl dying of consumption in the country. Then people came to Leamington to see the model, and were disappointed as much as I could make them. But in one case I weakly yielded to the urgent entreaties of Countess S ——, and took the little girl to London to be interviewed. I am sure this was a great mistake, the disillusion was unmistakable.

It is a great indiscretion for a photographer to show his model, his scenery, or his methods. He may be very proud of the power of dressing and talking to and posing a healthy girl of eleven or twelve until she looks like a dying girl of twenty, he may make a heap of earth and a few stones in a back garden look like the top of a mountain, he may throw the glamor of light and shade equal to Rembrandt's over his group, but he gives himself away body and soul if he takes credit for them. Better to be content with the applause he is sure to get for the completed work, rather than expose all the mean little dodges that go towards building up a complete whole that shows not only nature, but that nature has been filtered through the brain and fingers of an artist. Towards the end of this eventful year I produced a series of pictures of the story of Red Riding Hood which was not unsuccessful. Here is one of them. Notwithstanding the fame that "Fading Away" had brought me away from home, I did not notice that it had made any effect in Leamington. I don't think at the time it added a single sitter to the business, but it brought me many friends; among others at that time I became acquainted with the Rev. E. Bradley, Cuthbert Bede, author of that wonderfully popular book, "Verdant Green," which had the largest sale of any book of the time. I have a large number of his most interesting letters, and give an extract from one of them that may be of interest to portraitists as well as writers.

"By this post, I send, you my "Verdant Green," in which I have written your name, and which I hope you will accept. The likeness is no likeness at all, although done from a very good photograph by Mr. Rejlander. But it was drawn on the wood by John Gilbert, who is too great a genius to descend to the mechanism of copying. A new edition of "Verdant Green" was published last month, so it still sells! I believe that the sale of the complete edition is more than 100,000. The sale of Part I was much larger. Unfortunately I do not gain by it. In fact I have to purchase copies of the work, and the bookseller who hands me the books across the counter receives out of the 3s 6d. one shilling for his trouble—the author *Nil.* Such is life, and such is authorship."

I also became acquainted with two artists who did much for me in the after time, a sculptor and a painter, Alexander Munro and Henry Moore, afterwards R. A. Munro was a sculptor who, for grace and poetic feeling, had few equals among his brethren of the chisel; it was in his London studio during rare visits that I made the acquaintance of many of the young and promising painters, especially the pre-Raphaelite brethren. He died in 1871 when he might be still called a young man, and I lost touch of my connection with the renaissance of English art for a time. I must not forget, however, one of the most lively of our young painters, now a grave R. A. and, I think, a churchwarden and a town councillor also, who spent the summer of 1859 at Warwick, and of whose buoyancy of spirits and jovial gaiety I saw a good deal.

Outside of my family Henry Moore was my nearest and dearest friend up to the day of his death, two years ago, following that of his

MY PHOTOGRAPHIC VAN

brother, the well-known Albert Moore. The influence for good of such constant friends may easily be appreciated.

Badly as we were doing at home I still saw something of the world. I never wished to push myself into the society of celebrated people, but I plead guilty to the curiosity that likes to see them, and I was often much surprized at the goodness of people much older than myself, for whom my society could have no kind of attraction. I still continued to run up to London occasionally to Dr. Diamond, and keep up the acquaintance of many kind friends I had made there; among them I have met David Livingstone and his brother, Chief Baron Pollock, Joseph Durham, A. R. A., Hepworth Dixon, Dr. Percy, Robert Hunt, Roger Fenton, P. H. Delamotte, and nearly all those whose names are historical in connection with early photography, as well as many others connected with literature and art, very few of whom, alas, now remain with us.

PREPARING NEGATIVES FOR SLIDE MAKING. BY ELLERSLIE WALLACE.

There is surely no pleasanter work than to make slides from perfect negatives? But it almost goes without saying that we cannot always count upon the good fortune of having them

Supposing the negative to be varnished, it is not a difficult matter to touch out transparent specks and pinholes in any of the high lights. A neat dab of opaque color from the tip of a fine hair pencil settles it. But when the specks come in a mass of delicate half tone like clouds or distance, it is not so easy. I prefer to treat these with a medium-hard lead-pencil, sharp pointed, after first applying a drop of mixed Canada balsam and turpentine to the varnished surface, and then rubbing off with a tuft of cotton. This gives an excellent "tooth" for the pencil, and the transparent spot may then be worked at with numerous gentle punches with the point. The amount of deposit thus added is not great; so that it suits well on the lighter half tones, if only the work be neatly done, and *it must be*. In order to succeed, the negative should be supported on a retouching desk in a good light, and a magnifying-glass, not less than four inches in diameter, be interposed on the left side. It is a good plan, too, to use a card somewhat larger than the negative, having a hole cut in it, say the size of a dollar or less, so as to shield the eye from all light except that on the portion being worked at. It may happen that the pencil-work will cover the outer parts of a transparent spot very well, but leave a small speck right in the center that will still print through; in such a case it is better to apply liquid color with the brush point than to go over the pencilled work again in the hope of increasing the density. Of course these hints apply to any regular retouching on the surface that may be desired—and a great deal can be effected by a neat artistic hand.

I have gotten good results out of imperfect negatives in slide-making by the old method of covering the back with tracing paper, and then working up thin skies or weak shadows with the artist's stump and blacklead. Paper of fine texture can be found that will not leave any perceptible granularity on the picture when it appears on the screen, and there is certainly no way equal to it for forcing out detail in shadow that is visible, but too weak to print, and that extends over large portions of the picture. With this it is also possible to apply varnish or oil over solarized parts, so as to make the paper more transparent, and let the light get through. In architectural work, much good may thus be done with plates that have been exposed in a bad light, which gives feeble detail in the shadows and solarizes all such objects as towers, spires, tops of trees, etc., etc.

Supposing a negative, perfect otherwise, to show a thin sky from uneven coating, I prefer not to treat it at all, but during the exposure of the slide to shield the sky with a piece of dark thick paper roughly cut to follow the sky-outline. The sky of the slide will then come out quite clean.

We frequently have to deal with negatives that have been made in hand cameras, and show distortion of vertical lines. In slide making, this can be rectified by putting the negative in a camera with an ordinary swing-back, and keeping the sensitive plate vertical, using the swing as judgment dictates. If this is found to interfere with ease of obtaining sharp definition, some other lens should be tried, and after focusing, well stopped down.

If the image on the negative is merely "askew," a little adjustment before making the slide is all that is required. Cameras are now made with a convenient apparatus for effecting such changes in position. My remarks are intended to apply to slides made with the camera. If made by contact, the paper covering would be troublesome, but might succeed in diffused daylight. I merely give the results of my own experience.

THE CHRISTMAS TREE BY T. TROWBRIDGE

PHOTOGRAPHIC CHRISTMAS PRESENTS. BY F. J. BURNETT.

However much one may enjoy the giving of Christmas presents, the selecting of those that will be appropriate and acceptable, and at the same time come within the limits that the dimensions of one's purse puts upon his generosity is, to most people, something of a task. It seems as if it might be a very easy matter for him whose plethoric pocket-book permits the scattering of '98 model wheels or "Henry Clay's" among his friends and kindred, but the ordinary mortal is oftentimes sorely tried to know *what* to give this one or that one whom he wishes to remember, and this tax on his gray matter reconciles him to the fact that "Christmas comes but once a year."

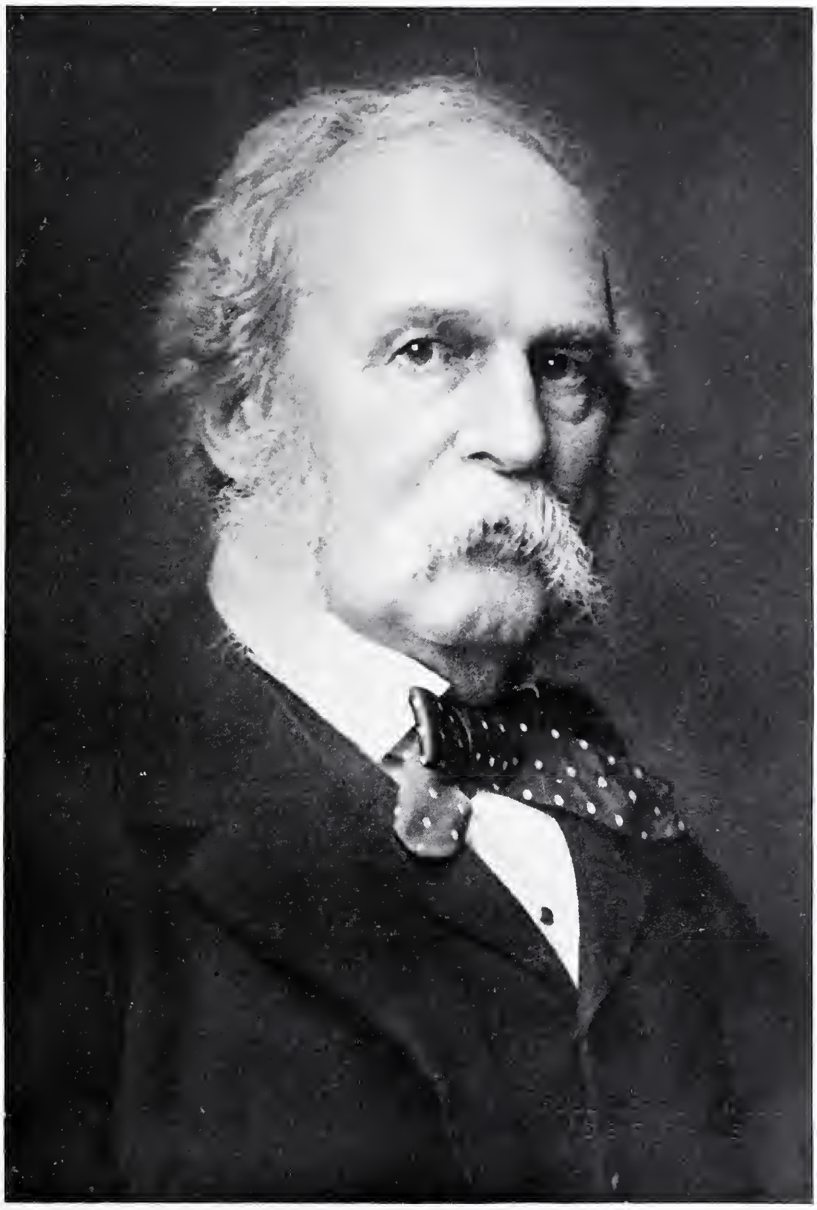
To the owner of a camera, however, the coming of Christmas with its attendant duties and responsibilities should be devoid of terrors, for he has the means at hand of evolving presents to fit all sorts and conditions of men and women. A little ingenuity will enable him to get up something that will give more delight to those of his sisters and his cousins and his aunts who have passed the pinafore age than almost anything he could *buy*.

A single ordinary silver print neatly mounted, makes a beautiful Christmas card, and one can add a verse or a sentiment with a pen on the margin or back of the mount, after the manner of machine-made Christmas cards, thus making it more apparent that it is not merely a photograph, but a photographic Christmas card.

Blue prints from negatives with strong contrasts, on good blue paper that will give clear whites, by slightly under-printing and mounting on white mounts, can be made to look like the Delft things that are so popular. The best subjects for this sort of thing are waterscapes, of course, being more Delftlike, but I have made excellent ones from a bit of railroad track, the main point being to have an abundance of high lights with a few streaks and patches of deep shadow. The bevel-edged cards that are sold at picture stores, for artistic maidens to paint blue poppies and pink sunflowers on, make excellent mounts for this sort of Christmas card, and quite a variety can be made from a few negatives by using mounts of various sorts, and making prints different shapes, and the variety may be increased by using other mediums, as carbon or platinum. It is no disparagement to the productions of Prang or Tuck to say that any sane person would rather have one of these home-made cards than any lithographed one.

Very pretty bookmarks can be made by mounting small prints or slices from large ones on ribbon of suitable length and color; and when one first tries it, it is surprising how many little pictures can be cut from larger ones for this purpose.

By covering the advertisement on a calendar with a print, or by detaching the calendar proper from its advertising back, and making a new back for it with a photographic decoration, another sort of present is made. Another sort can be made by squeegeeing gelatine prints



PORTRAIT STUDY

BY HOLLINGER & ROCKEY

on spoiled plates, which of course must be previously cleaned. They may have cardboard pasted on their backs and a leg attached to make them stand up, or, with no backing whatever may be set on an easel, and will look far prettier than one would at first suppose. Instead of old plates the prints may be squeegeed on the glass from photograph frames that are to be found in picture stores, which can then be returned to their frames, and you have a framed picture.

A very pretty album can be made by mounting prints on rather thin mounts considerably larger than the prints, and binding by means of a ribbon tied through small holes, in a cover of heavy rough paper. The writer once designed and constructed one with the aid of one of his obliging kindred. The prints were from 5 x 8 negatives, mounted on 8 x 10 white cardboard; the cover water color board, in one piece, covering the back. We made the holes for the ribbon fastening with an eyelet punch, such as is used for binding legal papers, but if this is not accessible a common punch that can be bought for a few cents at any hardware store, and a hammer, will do the work as well.

Before binding we looked up a verse or a few lines of poetry to fit each print; for example, these lines from Sidney Lanier's "Hymns of the Marshes":

> "And look where a passionate shiver
> Expectant is bending the blades
> Of the marsh-grass in serial shimmers and shades,"

for a bit of wind-blown marsh, and with French gold paint and India ink lettered it on the back of the mount of the preceding picture, so that when bound each verse would face its proper print.

Our subjects were suburban studies, bits of woodland and river, of meadow and marsh. The same idea is capable of considerable variation; a series of snap shots in the streets of your own city would be interesting and acceptable to any former resident, or to one interested in the place because *you* live there, or, if it be an important place, to anyone. A collection of corners of your own rooms with the furniture and belongings you use every day, and bits of your garden, would mightily please some of your kindred who cannot see these things every day. It will not require a very great waste of brain tissue for any camerist to make a number of such albums from negatives already on hand, and each year's exposures should supply the needs of each Chirstmas.

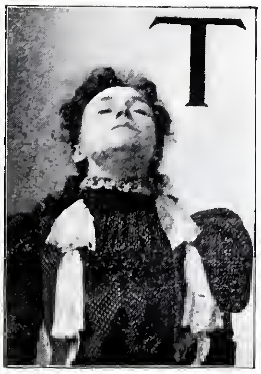
If one can string words together fairly well, it is an easy matter to make little booklets of type-written text and photographic illustrations, writing up some outing or journey, or merely explanatory notes of the pictures used. If tolerably heavy paper is used the same will answer for type-writing and mounts, if the prints are not over large, and then the sheets can be bound with any of the different devices for binding legal papers or pamphlets. Or one can find a poem that admits of easy and profuse illustration, like Mrs. Dorr's "Fallow Field," or the song of the brook in Tennyson's "The Brook," and typewrite or engross with a pen, a stanza on a page with an illustration for and facing each stanza, and make into the same sort of a booklet.

The giver of presents of this sort can have the satisfaction of knowing that his gifts are absolutely unique; that those to whom he sends them cannot already have the same thing, and that there is no danger of their receiving a duplicate from anyone else, which is something the giver of purchased presents cannot always know, and which is sometimes a great comfort after one's packages have been surrendered to Uncle Sam or the express companies or the A. D. T.

STUDY BY F. H. DAY

FACIAL EXPRESSIONS IN PHOTOS—AN INTERVIEW WITH OTTO SARONY.

BY GILSON WILLETS.

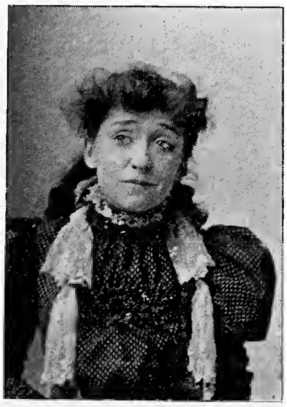


RESIGNATION.

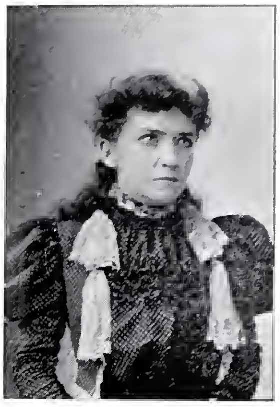
THE laity often passes judgment upon a photograph by saying: 'Why this doesn't look like our friend. It doesn't do him justice. The face might be of stone. It is totally devoid of expression.' In nine out of ten such photos the blame can be traced, not to the subject but to the photographer. Merely to photograph the human face, is not enough. There should be an indication of soul. Any ordinary draughtsman can draw a face, but the artist transfers to his canvas, not only face, but soul. Soul is just as important in a photograph as in a valuable painting. Only soul in a photograph is called facial expression."

The speaker is Mr. Otto Sarony, otherwise known as Sarony the Younger; the place, Sarony Gallery. Mr. Sarony is naturally a very reticent man. But show him that you are earnestly interested in photography and he will talk freely. Visiting photographers would do well to call uponhim. In a little chat he can say a great deal about photography as a profession, give many new ideas and practicable hints not found in books.

"The value of facial expession in photographs," he continued, "cannot be over-estimated. Unless a photograph contains that mobility of countenance which, on the instant, indicates the inward workings of emotion, it never does the subject justice. The eye has been called the window of the soul. It works in perfect and immediate accord with what the heart feels. It speaks more quickly, and frequently with greater eloquence, than the voice. But important as the eye is, the play of facial muscles is equally necessary if expression is to obtained.



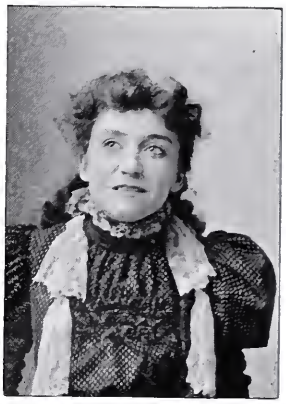
COQUETRY



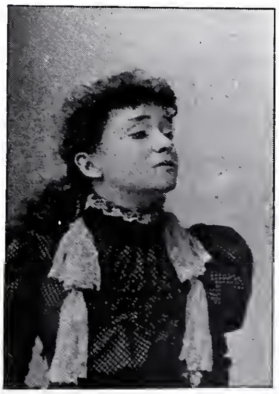
POSITIVE ASSURANCE.

"But how is the photographer to secure eloquence of eye and the play of the facial muscles? Suppose the subject poses before the camera in agonized self-consciousness. What if the subject presents a blank unmeaning stare, gazing at a given object like a face of stone? How can facial expression enter in the photograph of a person whose face is naturally expressionless?

"I will answer the last question first. A naturally expressionless face means, usually, one which is expressionless in repose. Such a subject should be studied carefully by the photographer. Where is the weak point in the subject's make-up? In what does he joy? In what does he grieve? In what does he become interested, enthusiastic, hopeful, and so on? There is always at least some one thing in which a person is interested; over which he will brighten up, in the cause of which his soul will become animated and manifest itself in facial expression. Find this one thing. This will be the one moment in which the subject will appear at his best. The photographer must take the picture in that particular moment. When the novelist, Wilkie Collins, came to our studio, he sat before the camera with a face absolutely expressionless. 'This will never do,' said my father, who then proceeded to engage the novelist in conversation. Suddenly he discovered a peculiarity of facial expression which was most interesting. It was while Mr. Collins was speaking of his favorite book 'The Woman in White.' At that moment my father made a quick exposure, feeling that he had taken the novelist at his best. And so



ROGUISH RECOLLECTION.



PATHETIC SOLICITUDE.

N. B.—With photographs of Minnie Maddern Fiske, showing the possibilities of "Facial Expressions" in portrait photography. Photos taken by Sarony for the *New York World*.

it proved. When Mr. Collins returned to England he wrote back: 'You have taken a photograph with a soul in it. Those taken over here lack expression in the face. They are libels. But I feel like giving your pictures to all my friends.'

ANXIOUS SELF-INQUIRY.

"In somewhat the same way the photographer should study and manœuvre with the subject who looks at a given object with a blank, stony stare.

"James G. Blaine sat here one day with exactly that kind of a stare. To my father who was to take his picture the situation seemed hopeless. But presently, remembering that Mr. Blaine was a great story-teller, my father cracked some sort of a joke at which Mr. Blaine smiled and began, in his calm way, telling one of his own stories. 'And now are you ready to take my picture?' he said, when he had finished the story. 'It is taken,' replied my father. He had caught Mr. Blaine at the right moment, just as he was reaching the story's climax, and that photograph was the best ever taken of the great statesman. It was one of the few in which soul manifested itself in that face which, in repose, was so like stone.

ANGUISH OF CONFESSION.

"I suppose this sort of a picture might be called a snap-shot. But it is the sort of snap-shot made successful by previous study of the subject. But the photographer who risks an instantaneous picture when the subject is unaware, must already have studied his subject; should be familiar with his habits and surroundings, and, as has been said, know the crucial moment in which he appears at his best. It is evident that some people can be made to have facial expression in a photograph only by means of a snap-shot But the game must be bagged by a sharp shooter. The game cannot be bagged by a slouchy sportsman.

FATALISTIC RETROSPECTION.

"But the most difficult subjects, and the most numerous, are the self-conscious—those who sit before the camera and in the attempt to pose, succeed only in obtaining awkwardness of body and a facial expression signifying torture and agony. A conscious person should never be told to 'look pleasant' or natural; for thereupon, his lips will spread in a ghastly smile, and he will look thoroughly miserable and unnatural. Self-consciousness is always sure to affect a photograph the wrong way. This is the reason that Chauncey Depew has never had a picture taken that does him justice. The photographer has yet to be found who can make Dr. Depew look unconscious while the camera is trained upon him. He never looks natural. If he could be caught unaware during a political speech, or when reaching the point of an after-dinner story, he could then see himself, in a photograph, as he really is.

FEAR AND HOPE.

"Another essential in securing facial expression is harmony between photographer and sitter. The silent, magnetic chord must be struck. This accounts for the great difference between the first and the last photographs which I took of Grover Cleveland. When he first came to sit for me, he was cold and indifferent. Accordingly his photographs were expressionless, his face was a blank, soul was wanting. Not so the last ones, however; for on this occasion he grabbed my hand cordially and talked with warmth and spirit. At last we were friends, harmony was established, and the photographs taken that day show his friendliness and fullness of soul.

FRATERNAL CONCERN?

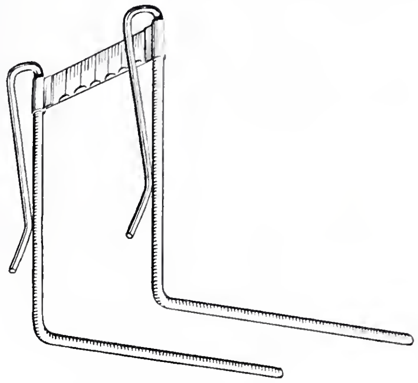
"Another important consideration in photographing the self-conscious, is to be alone with the sitter. Clear the room. Allow no third person in it, or even within hearing. When Minnie Maddern Fiske came here to sit for the photographs showing the various facial expressions used in acting the part of 'Tess of the D'Urbervilles' she refused to allow any one to remain in the room but myself. 'If there is an outsider present,' she said, 'I shall become conscious, soul will leave my face, and I will not get the pictures I want. Leave me by my self and I will think over the various scenes, and when I get myself into the right mental condition the correct facial expression will come.'

"Stage folks are, of course, most amenable to the camera. Facial expression and posing, with them, is a business. Their photographs almost always convey the existence of soul, in that they contain natural facial expression. Pose of body and face in the case of actresses, is usually artistic. And that is the reason photographers who take the 'profession' are so often cross-examined by private individuals. 'Why don't you take me like Ellen Terry, or like this or that actress,' they ask. 'I am just as handsome, I have just as good a figure, my gowns are made by Worth, and my bonnets by this or that fashionable milliner. Now why don't you make as good photographs of me as you do of Terry, Rehan, Bernhardt, and so on?' Now, the reason why, is obvious. For neither a beautiful face and handsome figure, nor even a Worth gown and a fashionable bonnet can give the natural facial expression which in a photograph makes the soul manifest."

FILMS THAT WON'T CURL, SIMPLY BECAUSE THEY CAN'T.

BY OTTOMAR JARECKI.

It is too good a thing to hope for, that the average roll film you come across is going to lie flat and limp as per program. Even if the old-time thin variety were restored to us—and why we have to do without it, who knows?—there is age and long confinement in close coils that give films a very kinky and contagious temper. The first attempt to remedy this defect as far as comfort in development was concerned, was to make use of the old fashioned wooden spring clothes pins. These were clamped to the tray rim, having been provided with angle shaped brass wires extending into the dish, under which the ends of the films were slipped. Incidentally, this tray was of tin, flowed over with melted paraffine and made to hold two strips of three exposures each, of the popular 3½ x 3½ size The pan measures 8½ by 12 inside at the bottom, with flaring sides and a rim 1¾ in. deep. Later, a wire clamp was devised independent of the clothes pins, and of this a sample has been sent to the editor for illustration, and this will explain the idea fully. Size will suggest itself. Four sets of clamps were attached to the dish, and the wires had thin rubber tubing slipped over them to prevent metal contamination. This small tubing is used for insulation purposes by electricians. This keeps the film perfectly flat, and to guard against another difficulty, that of the films sliding upon each other, a somewhat similar single clamp was set in the rim between the other two at each end of the dish. It will have occurred to the reader that this method does not encourage the wholesale development of numerous cut films, face down in one dish, as the inevitable damage to the surface is too aggravating to be tolerated by careful workers. On the other hand, not every one is in position to rig up the Ferris Wheel style of developing a whole uncut roll in one strip.



The fixing dish is similarly equipped, leaving off the dividing clamp, and it is just solid comfort to know that when a film is fixed, it is fixed all over and for good, without white patches showing at the final round up.

The soaking dish after fixing is arranged differently. Two stout brass wires are taken, bent somewhat in the shape of the cross-section of the dish, only skimped half an inch or more in length and depth. This pair is laid across the dish lengthwise and the films, two to the dish, are slipped under the suspended wires face down. The curl of the film keeps it off the bottom and thus in the best position to soak out the heavy hypo solution, and have it sink to the bottom of the dish. For fixing, a domestic granite ware dish was cheaply procured, of dimensions 10 x 15 inches, outside measure.

A system of continuous working can be planned, so that while one pair is washing, another is fixing, and the third is being developed. When development is complete, each pair is advanced one stage, and the pair in soak is dropped into a pailful of water, there to remain until the final rinsing and glycerining.

If anything in the above should not appear perfectly clear to anyone wishing to experiment with the above devices, I shall be glad to answer any questions through the mails.

A TEA PARTY BY C. F. JENKINS

THE DAGUERREOTYPE. By CHARLES L. LOCHMAN.

It was in the year 1839, when the discovery of Daguerre, known as the Daguerreotype process, for making pictures with the camera obscura by the chemical agency of light was given to the world. No discovery for the last sixty years has caused such a universal sensation in both the old and new world, as well among the scientists as among the masses, who were astonished at the seeming magical manner in which likenesses could be taken. Although the process is no longer carried out, I consider the Daguerreotype the finest and most permanent heliographic picture that was ever made. It is unequaled for microscopic detail, modulation of shade and delicacy of half-tone.

The material constituting the picture, under ordinary circumstances, is absolutely unchangeable. I have in my possession pictures made fifty years ago which are as clear and perfect as on the day they were taken. There is no photographic picture that yields as fine a copy as a Daguerreotype. The best way in taking a copy, to avoid reflection, is to let the sun's rays fall upon it at an angle of about 45 deg. In some cases there may be a slight scum on the surface, from insufficient washing, which may be removed by means of a fresh solution of sodium hyposulphite. By no means use a soda bath in which prints or negatives have been cleared, or you will ruin the picture by a deposit of silver on the surface.

I would not be surprised if some enterprising photographer in the near future would announce that he is now prepared to make the long neglected but beautiful Daguerreotype picture, unrivalled for permanency and delicacy of shading. The pioneers in this beautiful art who have been permitted by kind Providence to see the wonderful application of photography to every department of human knowledge and refinement of life, are but few in number, and a brief account of the Daguerreotype process may be interesting to the younger photographers. Your firm, Mr. Editor, were then as alert as they are now in supplying everything necessary in photography, with all the requirements in making the Daguerreotype. They were the first, and, I believe, the only ones in this country that rolled the silver plate, stiffened with a backing of copper, on which the Daguerreotype picture was made.

Detail of the Process.—The silver plate being highly polished with rotten stone and by buffing with jeweler's rouge, is sensitized as follows: Two boxes are employed, the construction of which is shown in Fig. 1.

The wooden box, A, contains a rectangular glass vessel of similar shape, with the top edges ground evenly, so that when not in use it is covered with the ground glass plate, the edge of which is shown at D, cemented to the lower surface of the sliding lid, B. The box is also provided with a loose top, which is pressed down with a screw, supported on a cross-beam (which are not shown in the cut), to keep the box tightly closed, and under which the sliding lid moves.

In one box of ordinary size is placed about half an ounce of iodine on bibulous paper; in the other box, called the "quick" box, similar in construction but not quite so deep, is placed a mixture of bromine and slaked lime (about 1 to 30) to the depth of an inch. The lime prevents the too rapid volatilization of the bromine. Some used a liquid quick, 1 ounce of bromine added to 1 quart of lime water.

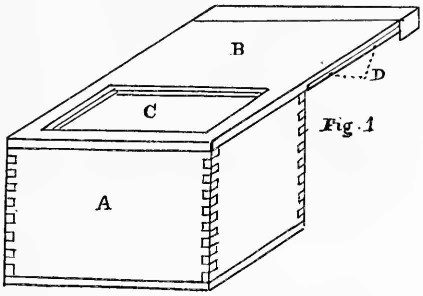


Fig. 1

In sensitizing the plate it is laid face downward on the rabbets of the opening C, the lid being first pushed out, and then slid back over the glass vessel containing the iodine, and left until it has acquired a deep yellow color, which requires from part of a minute to several minutes, depending upon the temperature of the room. The plate is examined from time to time in a dimly lighted room as to its color. It is now removed and similarly exposed over the bromine, in the "quick" box, until it assumes a bluish steel, or plum color. This is the most critical performance. If exposed too long or too short a time, no impression could be made on the plate, or but a very slight one. It depends altogether upon the temperature. and strength of the "quick." In a very warm room the time may be only a second, while in a cold room it may require several minutes.*

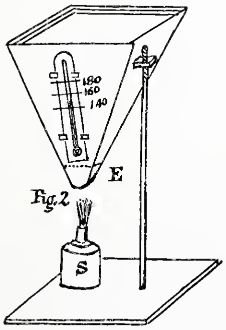


Fig. 2

The plate is again exposed a second time over the iodine, half the time of the first exposure. It is now ready to be exposed in the camera, precisely as with a dry plate, and requiring about the same time as a slow dry plate. It is now developed by being exposed to the vapor of mercury (one or two ounces) contained in an iron vessel, shown in Fig. 2, and heated by means of a spirit lamp, S, to a temperature between 140 and 180 deg. F., until the details are all out in the darker parts. It may require from a few minutes to a quarter of an hour, being occasionally examined in a feeble light. The next step is the removal of the iodine and bromine by means of a solution of sodium hyposulphite, and after being washed in a stream of water for a minute, it is subjected to the gilding process by means of a solution of hyposulphite of gold, prepared by pouring a solution of 15 grains of terchloride of gold in a pint of distilled water into a solution of 60 grains of sodium hyposulphite dissolved also in a pint of water. This solution is poured on the plate while being held perfectly level with a pair of pincers, or on a leveling stand, and heated to boiling, or until the picture comes up brilliantly. After being washed for a few minutes under a tap of water, it is dried with a spirit lamp and put in an appropriate case.

The most remarkable in the process of Daguerreotypy is the development with the vapors of mercury. Was it accidental, as it has been asserted, by throwing an exposed plate in a box of rubbish which contained mercury, or was it by one of those unexplained, psychological influences which sometimes induce an experimenter to make use of means which in ordinary reasoning would be most unlikely to lead to desired results.

CROSSING THE BROOK BY ALFRED CLEMENTS

TECHNICAL KNOWLEDGE: ITS VALUE TO CRITICS.—Harry Quilter, in his well-known work on "Art," makes the following remark, which every photographer will do well to ponder: "I have given some years of my life to the study of pictures and to the technical processes of art, for experience has convinced me that without practical power of drawing and painting no real knowledge of pictures is possible."

---

* These accelerators were not used by Daguerre. He simply coated his plates with iodine, which required a long time in bright sunlight to produce an impression. They were introduced for the most part by American investigators.

PHOTOGRAPHY, PAINTING AND SCULPTURE. BY A. S. SOUTHWORTH.

Confining ourselves to this side of the Atlantic, American painters and sculptors, until a very recent date, were wont to sneer at and actually deride photography as an important adjunct of their professional work in the formative processes in their studios. This applied to the most distinguished masters of our native art. The late George Inney or A. H. Wyant at the head of landscapists would show their teeth in the wildest kind of wrath should one suggest there were artistic expression, tone, perspective or power in the finest examples produced by the camera. The same was true of our leading portrait painters and sculptors, and it was not until the very highest class of magazines and art journals in the United States and Europe put aside wood and other engraving for half-tones after the camera, that the true art value of the latest development of the invention of Daguerre began to dawn upon and influence their professional workmanship. Such a phase of the innovation was made more emphatic by the deadly blow which this revolution in art methods dealt to the professional illustrators in black and white. There are also many other significant and collateral facts which tell on the potent influence which photography in its artistic treatment is bearing on the painting and sculpture of the present time. For example what educated artist of our generation goes afield to wrestle with his summer day "studies" in color in land or waterscape, in forest glen, in the varying phases of sky, sun, or moon, neglects to take with him a camera, finding on his return a new mystery and refinement in composition, before beyond his ken, by the product of his negatives. Many, of course, are not willing to allow this soft impeachment, but that makes the situation all the more interesting, for it only hastens the day when in its true relations to the higher arts, photography will assume without doubt or denial a positive position.

PORTRAIT BY REUTLINGER

PORTRAIT BY REUTLINGER

Another important feature but little known to connoisseurs who believe they have reached the acme of knowledge in portraiture, either in pigments, water color, pastels, or plastic art, is interesting. Artists in any one of those branches, who formerly affected to despise those who would work from photographs, when a living subject was available, now not only employ one negative made under their own eyes in the studio by a series embracing many views of the face and head, posed in a dozen different ways with photographic reproduction of draperies, differing arrangements of the hair, and so on. A celebrated sculptor in this city has been known to take as many as twenty-five negatives of a splendid subject, and then with his head and shoulder measurements with the callipers, say to her "I will only require one more sitting, and my work is done."

A propos of the subject above treated English technical and artistic writers on photography are pointing out a line of argument in harmony with our position. They claim that the misuse or misunderstanding of the word *imitation* and the true value that the representation of "things as they are" cannot result in artistic composition are even more plainly illustrated in the consideration of the conditions of portraiture than in landscape where so much has been achieved. In essence artistic composition is the same in one class of work as in the other, but this is often disputed or misunderstood.

Portraiture must concern itself chiefly with imitation, in the sense of personal pictorial expression. In a likeness, the person must be depicted as he is, that is, as he seems to us in the way we think the character best, shown or the aspect of the figure most natural, and cannot such a result be artistic in composition? Surely the limitations here for the photographer are very few indeed of an absolute nature. If the photographer have the necessary sympathetic influence over the sitter such as the painter-portraitist himself should possess, with the proper power of perception, and the ready and complete mastery of technique as to light and tone rendering, it is difficult to understand what is lacking for the particular purpose, save color.

That any artist should put into the portrait of a face more than ever could be expressed by that face at any one time is plainly absurd. Such a procedure implies a new face and character, and is not portraiture.

THE THREE COLOR PROCESS. THE YELLOW NEGATIVE.

By P. C. DUCHOCHOIS.

THE yellow negative is obtained, as one knows, by the intervention of a screen (color-filter) absorbing the yellow radiations, darkening the green and but little interfering with the action of the blue rays, for if yellow were printing in the parts which should be blue, there would result a greenish blue unlike the color of the original.

To obtain this negative, most authors recommend non-orthochromatic plates of medium rapidity, and to expose through a violet screen, and even without a screen, which latter method is quite rational, since these plates are insensitive to red and yellow, and very little to dark green. The resulting negative consequently resembles an ordinary one, being opaque in the parts corresponding to the most refrangible rays and transparent for green (E), yellow, and red. Hence *yellow prints for red*, from which results that, by superposing the monochromes, red tends to orange, and one obtains tints and shades different from those of the original. To correct these defects as much as possible, it has been found necessary to subdue the effects, originated from the yellow printing in red, by first printing the yellow monochrome and using a red ink reflecting blue, such as carmine and madder lake, for example, to form a vermillion red with the yellow. But the general appearance is nevertheless thereby impaired, pure red never obtained, and various foreign tints and shades into which yellow unsuitably becomes a component are formed.

This manner of operating to obtain the yellow negative, although giving satisfactory results when photographing from nature, is wrong in principle. The three negatives ought to have the same character; only the parts corresponding to the eliminated color should be transparent, more or less according to its intensity or the proportion into which it enters in the hues; they should also be transparent for black and opaque for white, that is, the transparency in the blacks must be very pure, not fogged, and care should be taken that the white parts be not solarized, for, necessarily, different tints would be there substituted for white; in the print from the red negative, for example, there would be red, blue from the blue negative, yellow from the yellow negative, and, by superposition, these parts, which should be white, would be more or less variously colored. Similar effects would also result if the other intensities, those from the color not eliminated were not sufficiently intense.

The introduction of colors foreign to the original, often remarked in three-color prints, have no other causes than those above pointed out.

The rule is that:

The red negative, that obtained through the green screen, should be transparent only for red and black and opaque for yellow, blue, and white.

The blue negative, that obtained through the orange red screen, should be transparent only for blue and black and opaque for red, yellow, and white.

The yellow negative, that obtained through a violet screen, should be transparent only for yellow and black and opaque for red, blue and white.

Hence, to obtain a correct yellow printing negative, an orthochromatic plate must be employed, and it must be sensitive to red and as little as possible to yellow. Malachite green is probably the best color-sensitizer for that purpose. Its maximum of absorption is at C and the minimum, which is very low, extends from $C\frac{1}{2}$ to $D\frac{1}{3}$ E; hence of the red sensitizers (cyanine, methyl violet, etc.), it is that which sensitizes the least for the yellow radiations and whose red sensibilization extends the most towards the extreme red. Therefore certain reds will be impressed during the exposure-time through a suitable yellow-absorbing screen, but if the reds are deep, then their impression will not be sufficient, and one should have recourse to a short supplementary exposure through a screen of medium intensity absorbing all the rays but the red and the orange red to obtain the desired result without risk of having the blue, the violet, and white, solarized.

THE DEVELOPMENT OF THE BURNISHER. BY E. J. PRINDLE.

BURNISHED photographs have always been the most popular photographs with regard to finish, although the matt surface has a large and increasing number of friends. The reasons for preferring the burnished print are probably that this style of finish is best adapted to show the details to the best advantage and, perhaps, our primitive liking for that which shines and glistens.

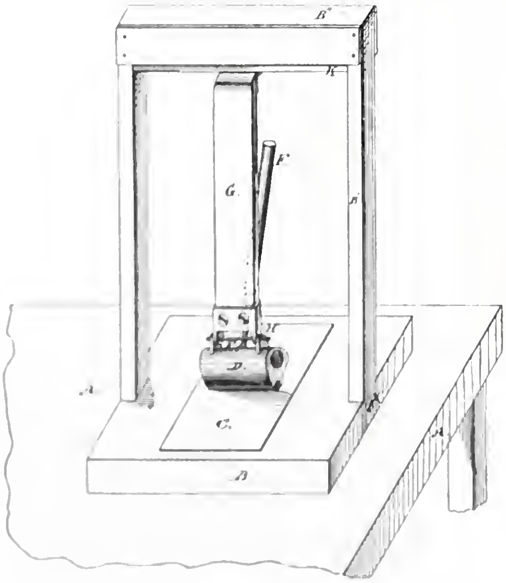


FIG. 1.

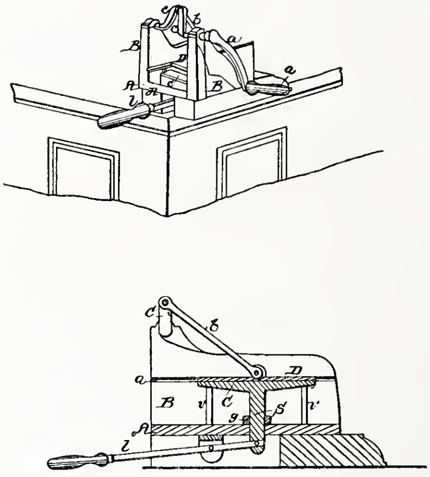


FIG. 2.

The development of the burnisher from the original spoon-shape hand tool to the present perfected machine is marked by a considerable series of interesting steps, showing that the form of burnisher now in use was only devised after long and arduous labors.

The first implement used for burnishing was a hand tool having a rounded end somewhat like the bottom of a spoon, and this was rubbed with considerable pressure over the surface of the picture. The same means is used to some extent by jewelers, shoemakers, and in other arts at the present day.

To give greater pressure over a larger surface the construction shown in Fig. 1 was devised. The flat bed supports two standards that are united by a cross-bar at the top. A stiff bar is hinged to the cross-bar, and it carries at its lower end a metal shoe having two lugs through which a pin passes. A head, having a hardened and polished bar dovetailed into its lower face, is hung on the pin in the ears of the shoe; and a long handle is secured in the head. By moving the handle, the polished bar is rubbed over the surface of the picture with considerable force by a toggle-joint action.

A more convenient but probably less effective form of machine followed in the shape illustrated by Fig. 2. The bed plate supports two sides having horizontal grooves in their inner faces, in which fit the edges of a steel plate whose under surface is highly polished.

The plate has a pitman or connecting rod jointed to a lug on its back, and the other end of the pitman turns on a crank shaft that is turned by hand. A reciprocating motion is thus given to the steel plate. The picture is pressed

THE CLOSE OF DAY

BY L. V. KUPPER

against the polished surface of the plate by a table that moves vertically on a stem and on guide pins passing through the bed plate. A hand lever under the bed plate serves to lift the stem and table to carry the picture against the burnishing surface.

The first instance of the use of a heated burnisher is that which is the subject of Fig. 3. The picture is held on a convex block, the block having this shape to counteract the curling of the print. A steel plate whose lower edge is polished and curved to fit the block, is bolted to a rod that is guided in the two vertical posts on the bed plate. Screws in the tops of the posts serve to regulate the pressure on the picture, and a hand lever that is pivoted to the bar and that engages a hole in the bed is used to reciprocate the burnishing plate. An alcohol lamp is situated at the end of the picture block to heat the burnishing plate, and a much higher gloss is obtained than was possible before.

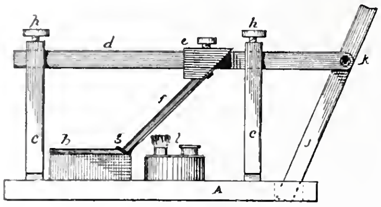


FIG 3

In the burnisher shown in Fig. 4, there is no motion between the polishing surface and the picture. The picture lies face down on a polished bed of metal that is supported on legs. A pressure roller, turned by hand, lies on top of the bed and carries, on its journals, journal boxes having stems that support a carriage below the table, which carriage is for the purpose of bearing on the under side of the table to hold the pressure roller down. On the upper surface of the carriage are rollers that run on the under surface of the table. The stems of the journal boxes occupy holes in the carriage, and are adjusted by screws on the carriage. This machine depends entirely on the mere pressure of the picture against the polished table as the pressure roller passes over it.

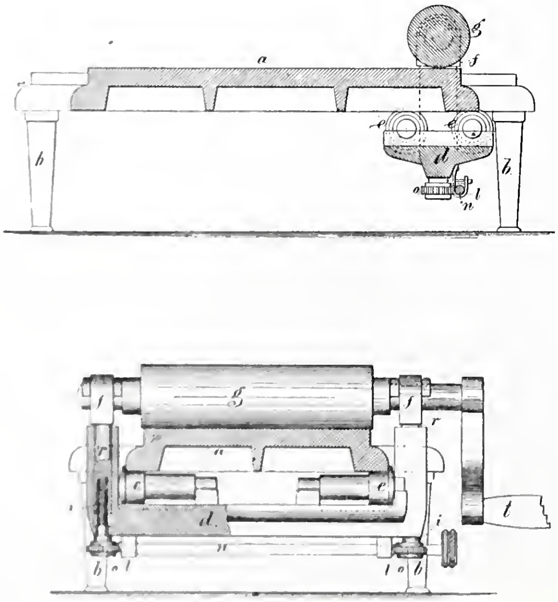


FIG 4.

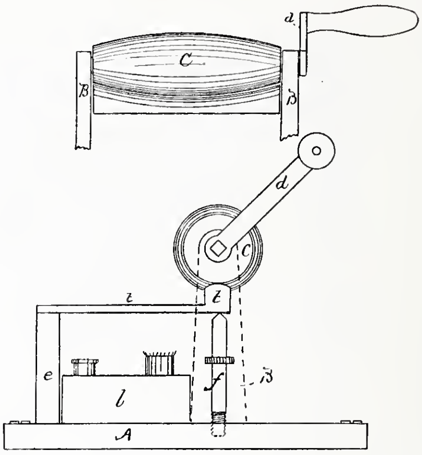


FIG. 5.

A curious expedient for curling the pictures automatically is shown in Fig. 5. The polished burnishing bar is mounted on the end of a spring plate that is secured to a standard on the base.

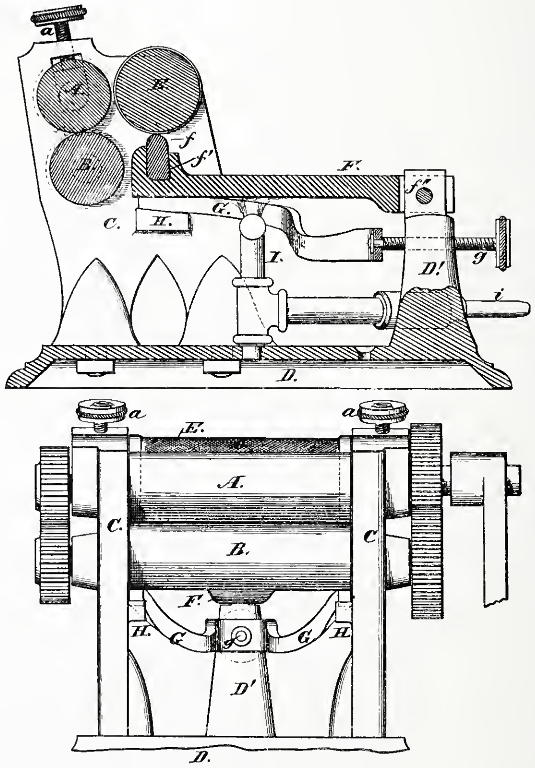


FIG. 6.

The feed roller is mounted above the burnishing bar in standards, and the bar is forced against roller by a screw in the base plate. A lamp heats the burnishing bar. The roller is made cigar-shape, and the burnishing bar is correspondingly formed, the effect being to curve the picture backward.

The machine shown in Fig. 6 is similar in principle to that last described, having a feed roller over a burnishing bar, but the curling of the picture is accomplished by passing it through a pair of feed rollers geared to the main roller and so placed as to bend the picture as it leaves the burnishing bar. The bar is adjusted by the wedge-shaped ends of a yoke that is moved by a hand-screw.

Another variation of the form of burnisher in which a feed roller drags the picture over a burnishing bar is shown in Fig. 7. The roller and bar are here placed vertically so that the picture may be seen as the burnishing takes place. The feed roller is rotated first one way and then the other by a gear segment carrying a handle. The burnishing bar is formed on a tube through which the heat passes from a removable heater in the base

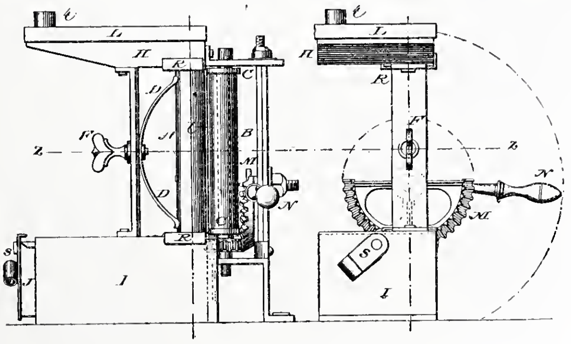


FIG. 7.

The best form of the feed-roller burnisher-bar type of burnisher is illustrated in Fig. 8. The feed roller is mounted in bearings in a frame, and the hollow burnisher bar has two forwardly projecting ears that rest on set screws in the frame (the set screws being for alignment) and it has also a rearwardly projecting ear in which is mounted a hand screw to regulate the pressure against the feed screw. A lamp heats the burnishing bar.

The latest important improvement in the burnisher is the form in which a feed roller and a burnishing roller travel at slightly different rates of speed, thus combining the advantages of the old forms in which there was simple pressure of the picture against a polished surface with those forms in which the picture travelled over a large extent of polished surface. Such a burnisher is shown in Fig. 9. The lower, or burnishing roller, is mounted in fixed bearings in the frame, and the upper roller turns in journal blocks that fit vertical slots in the standards. The journal blocks are forced down by a hand-screw which is jointed to two levers that bear on the blocks. A Bunsen burner is mounted in a bracket on the frame and extends inside the burnishing roller to heat it. The gas is regulated by a plug valve, and the inflow of air is controlled by a sleeve on the bracket, the sleeve and bracket having holes that can be made to coincide. The gases of combustion pass through holes in the opposite end of the burnishing roller and escape through a surrounding pipe.

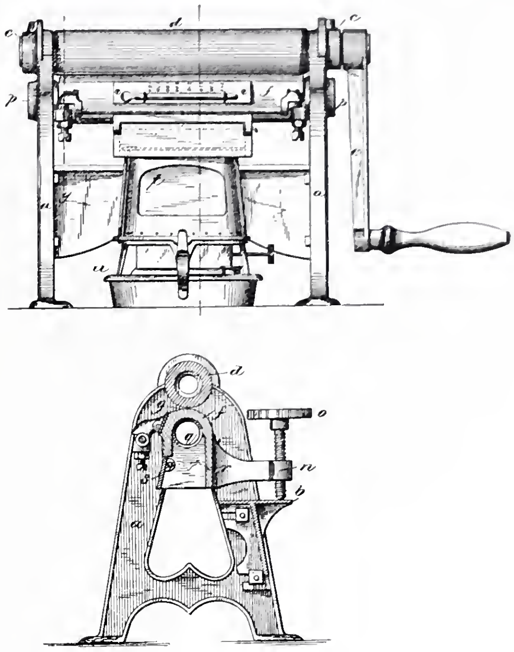


FIG. 8.

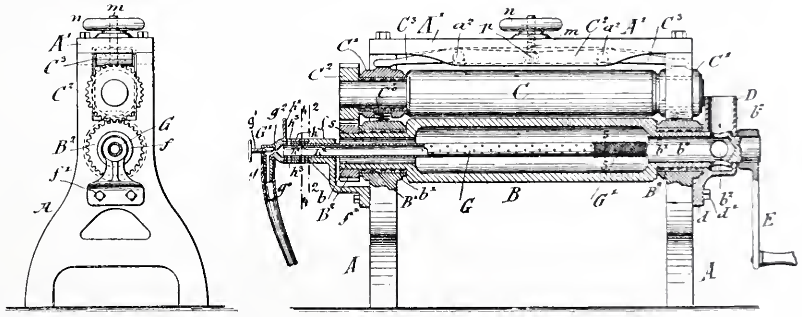


FIG. 9.

It is difficult to foresee any further great improvements in burnishers ; but, in view of its history, it is certainly not safe to say we have reached perfection.

TONING WITH METALS OTHER THAN GOLD. BY B. O. B.

THERE are, in addition to gold, three other metals which may be, and often are, used to tone a silver print. In order of permanence, they are platinum, uranium, and lead.

A piece of P.O.P. platinum toned is as permanent a production as it is possible to obtain with silver as a printing basis. Platinum tones range from a delightful sepia to a warm brown, or with an extension of operations to be described below, a rich engraving black may be obtained. Double toning, in any case, is entirely absent, and this method is both quicker and less costly than gold. The tyro, struggling in vain with the sulphocyanide bath, will find in this a pleasant termination of all his difficulties.

Uranium tones are unsuited for P.O.P., but they are *par excellence* with bromide paper. In the course of years they slowly fade, leaving the print in its original condition before toning, and it may be restored to its pristine bloom and beauty by simple re-immersion in a fresh bath. The color imparted to the print by the uranium is extremely beautiful, being generally a warm red or brown.

Lead, as a toning reagent, lacks in permanence what it makes up in beauty, a print thus toned rarely lasting more than two or three years. It may be used with great advantage for proofs, etc., which are not required to be very lasting. Photographers are often chary of "wasting" gold on proofs, and yet desire to let their clients see what the finished photograph will look like. *Verb. sap.* Lead tones resemble those obtained with gold, a rich purple, cold or warm.

Having given a brief summary of the leading characteristics of these baths, I shall now proceed to describe the methods of working them in detail.

Platinum Toning.—The first and foremost requisite for platinum toning is, of course, potassium chloroplatinite, which is commercially retailed in 15-gr. tubes, hermetically sealed, just like gold chloride. The contents of a tube should be dissolved in boiling distilled water 15 ounces, and kept in a bottle round which has been pasted brown or black paper to keep out the light. Under these conditions it will keep about eight months.

If with gold there are a multitude of formulæ to select from, there are even more with platinum, no two that I have yet seen being alike. Briefly speaking, however, there is but one essential point—an acid solution of potassium chloroplatinite. Whether the acid be nitric, hydrochloric, citric, phosphoric, or what not, matters little, although the organic acids, such as lactic or citric, have less tendency to stain than the mineral acids (hydrochloric, nitric, etc.)

The following, recommended, I believe, by Mr. Lyonel Clark, will be found excellent in practice. The solution consists of

Chloroplatinite of potassium.......	1 part
Water.............................	250 parts

To this is added sufficient nitric acid to turn litmus paper red. The print is washed in plain water to remove the soluble silver salts before toning. It is then laid face downwards on a sheet of glass, upon which has previously been poured a small quantity of the above toning solution. This is better than flooding the print in the usual way, as it requires only a small amount of solution, which, by the by, loses its properties rather rapidly. An ounce thus used will tone an 8 x 10 picture with ease.

Another formula which yields, in my hands, perhaps the best results of any is the following:

Potassium chloroplatinite........	2 grains
Sulphuric acid....................	10 grains
Water............................	10 ounces

Before and after toning, the prints must be immersed in a solution of salt 1 ounce, water 8 ounces, and then thoroughly rinsed. This is to ensure the removal, in the first case, of all soluble silver salts, and in the second, of all soluble platinum salts. This is the the great secret of successful working.

The fixing bath in this case should be—

Sodium hyposulphite	4 ounces
Sodium sulphite	1 ounce
Sodium carbonate	½ ounce
Water.........................	20 grains

Printing should be carried on rather further than for gold toning. The time to stop toning will be found from experience.

I promised above a method of obtaining black tones with platinum. Here it is:

Print deeply, tone for five minutes in—

Gold chloride...	3 grains
Acetate of soda	¼ ounce
Water....................	16 ounces

Wash well and tone as above.

Matt surface P.O.P. of course gives the best results with a platinum bath, and a print on this paper well toned will compare very favorably with a platinotype, both in appearance and permanence.

Uranium Toning.—To those who admire the facility with which bromide prints may be made, but who dislike their cold black tones, the uranium bath is indeed a blessing.

Prints should be rather weak and underdeveloped, as a slight intensification takes place. They must be thoroughly washed to free them from hypo, and then immersed in—

Uranium nitrate	50	grains
Pot. ferridcyanide...	50	grains
Glacial acetic acid....	¼	ounce
Distilled water.......	10	ounces

The image turns a reddish brown. As soon as the desired tone is obtained, remove it and wash in running water till the yellow color is entirely removed from the high lights.

Lantern slides may be treated in exactly the same way as, and even in the same bath with, the bromide paper.

Uranium tones, be it observed, do not suit every subject, and care must be exercised in producing them. What could be more ludicrous than a winter landscape, suggestive of frost and snow and bitter cold, printed in a warm red? Or, what again more in accord with the subject than a beautiful "sunset" effect of a rich harvest scene printed in the same striking color.

OUTSIDE THE SUB-TREASURY BY W. H. COOPER

Lead Toning.—To produce lead tones, the following solution must be made up in the manner described: Dissolve half an ounce of lead acetate in 20 ounces of boiling distilled water, and while the water is still hot, drop in, in small instalments, 4 ounces of hyposulphite of soda. It is most important that the water is distilled, otherwise a dense precipitate will form. As it is, there will probably be a slight one, which must be shaken up and used with the solution. None but the veriest tyro need to be told that the above is a combined bath.

Printing should be carried on very deeply, until the shadows are completely veiled and the high-lights have begun to change. The prints are then immersed in the cold bath. In a few seconds they will turn a horrible mustard color, a sign that fixation is taking place. Soon they will improve in appearance, and pass through various shades of red and brown to their final tone. At any stage, when the color is pleasing, they may be removed, washed for half an hour in running water, and dried. Toning, be it said, may be carried on in bright sunlight, after the first minute, with no ill-effect on the print.

What the exact action of this particular bath is, is as doubtful a factor as the permanence of a print thus toned. But, as I have said before, permanency is no consideration with proofs.—*The Amateur Photographer* (British).

FINISHING NEGATIVES. BY CHAPMAN JONES.

It is customary in work of almost every kind to go over it carefully at its completion, removing defects, and generally perfecting it—giving it the finishing touches. Photographic work is no exception to the rule. Of course if the photographer is careless, or if in commercial work the price he gets or the time allowed him gives him no opportunity to finish his work, it is issued in a crude condition It is well known that the touching up or retouching of photographs has been carried to such an extent in modern times that some things called photographs have so small a proportion of photography in them that it is as much a misnomer to call them photographs as it would be to call a cup of tea a cup of milk, because of the small proportion of milk mixed with it. But, on the other hand, it would be as unreasonable to exclude all handwork because an excess of it is out of place, as to condemn moderate eating and drinking because some are gluttons and drunkards. And in such cases it is impossible to draw the line that shall separate the virtuous use of a power from the vice of excess. It is, however, always possible to keep so far away from the doubtful zone that exists between the good and the bad as to be above suspicion, and the desire to do this ought to be the guide of every photographer who is honest to his calling.

We say it is impossible to draw any line between the right and the wrong, and an illustration will perhaps indicate the kind of difficulty that attends the attempt. Suppose a round spot of clear glass a quarter of an inch in diameter on a cabinet portrait negative. If this spot occurs in the background, and the background prints black, it may be entirely negligible. If it comes, say, on the skirt of the dress, with a fold or shadow crossing it, it may be filled in, and the print is still a photograph, and there is no dishonesty or deception in calling it a photograph, and in omitting reference to the blemish that has been removed. But if the spot comes on the face, the most skilful of retouchers may work it out, and may even have sittings from the model to assist him in properly adding the missing details, but the result cannot honestly be called a photograph, because the most important part of it is a mixture of photography and hand painting. Illustrations of this kind could easily be multiplied. A photograph is supposed to present an accuracy that has become proverbial, that is, a truthfulness with regard to the actual object before the camera. Any after-work that tampers with this accuracy is to be deprecated.

It is impossible to photograph a type. An example or illustration of a type can be photographed, but the type itself exists only in the imagination, and though it may be painted, it cannot be photographed. The painter, in drawing a landscape, may alter some of the details before him, and so, perhaps, make his picture represent more strikingly the important characters of the country. This a photograph cannot do. He may shift a foreground object, and so on, but that is altering the landscape itself, not altering it in his view of it. His photograph is of the thing as it was when he photographed it, and if he alters his photograph, and succeeds in improving it pictorially, or making it more generally representative of the type, he may have produced a better and more desirable picture, but it is a mistake to call it a photograph, for it has lost the chief characteristic of a photograph, namely, the proverbial accuracy that is independent of the worker. We do not mean that general truthfulness that requires the greatest skill to attain to, but the mechanical accuracy which is present in all photographs, and is their chief characteristic, though it is sometimes so hidden that it needs a scientific examination to discover it. It makes no difference so far as the principle is concerned. whether the painting be on the negative or the print, and it is for those who make pictures by a combination of photography and hand-painting to invent a term that shall fairly describe their productions. If they lack the power to do this, that is no excuse for the misapplication of a word that has long been in use, and that specifically signifies something different.

It sometimes happens in a landscape negative that the sky and the land are both well represented, but a miscalculation either in the exposure or the development has given too dense a sky, so that to print it would ruin the rest. To get over this difficulty by non-photographic means is in general an operation that is on the border between the justifiable and the wrong. One might conceive of cases in which any such change would rob the photograph of its chief merit, but in other cases it is not so, and as the whole range of luminosity cannot, let us suppose, be reproduced, and there is a gap between the brightness of the sky and that of the landscape, it may be better to reduce this gap than to resort to other methods of overcoming the difficulty. We consider that the best way of doing this is to retard the printing of the landscape, and so give time for the sky to show.

To keep the various parts of the landscape true among themselves the retardation must be even, and no moving about of cloths on the negative during printing, as sometimes recommended, will do this. Probably the best material to use is the so called "mineral paper," which can be obtained from the Autotype Company, and doubtless other firms also. But we differ from some in the method of its application. It is of little use to secure it only to the edges of the negative if a part is to be cut away, and we think that for any purpose it is best fastened to the back of the negative by pasting it all over. For this purpose paste must be used, and not gum or glue, and when dry the surface should be of a uniform whiteness.

To remove the part that is not wanted, that over the sky, for example, the negative is placed on a retouching desk, and a knife is drawn along the skyline with just sufficient pressure to cut through the paper. If now a small brush, such as a camel-hair pencil, is dipped in water and used to moisten the border of the paper that is to be removed, taking care to place the negative so that if any water runs down it will not go over the paper that is to remain, it will be found quite easy to scrape away what is to be removed, as a pulpy mass, without any injury to the other.

Such an operation as that just described has a definite effect upon the negative, and with careful work every print will be the same. The two parts of the negative are exactly as before, except in the relation that each as a whole bears to the other. From a photographic point of view this method is preferable to the printing in of another sky, and even this may be regarded as permissible in some cases. But no such operation should be undertaken if there is any doubt as to whether it will effect the principal characteristics of the photograph, or if it seems likely at any time to cause deception. The real photographer, if he take any pride in his work, will always feel most satisfied and most honest, if there are degrees of honesty, when, the result being the same, his picture has been produced by simple and straightforward photographic methods.—*Photography.*

ON THE BEST FORMS OF LENS TO USE FOR PORTRAITURE.

BY W. K. BURTON.

The time has passed, in most parts of Europe and America at any rate, when the word "portrait" placed before the other "lens" amounted almost to a fetish, it being believed very firmly that there was some quality in a "portrait lens," apart from angular aperture, flatness of field, and all the recognized attributes of lenses, rendering it in some peculiar way more fit to "take a portrait" than any other form of lens. That there are countries we wot of where the fetish idea still exists—where the first ambition of a young photographer beginning business on his own account is to possess a lens "dubbed "portrait" —does not much concern us here. It is good for opticians, and these will continue to issue "portrait lenses" as long as lenses with such a title are demanded; nor do we mean at all to suggest that lenses bearing the name are not sometimes better than any other for portrait work, but we think that all photographers should understand just in what way they are better, in what particulars they show no advantage over other lenses, and in what they are inferior. The subject is one that we have treated once before, but the recent revolutions—if we may be allowed the term—in lens making greatly change the point of view.

The distinguishing feature of a portrait lens, whether it be of the old Petzval form, or of any of several newer, may be said to be that it works at an aperture of not less than *f*/4, sometimes approaching *f*/2, giving perfect definition over at least a small area, and being practically devoid of chromatic aberration. These qualities were of the greatest value in the days of wet plates, when one of the greatest objects was to reduce exposures, and they are still useful in some cases, but in a much more restricted degree than they once were.

In the first place it is not at all often with the extraordinarily rapid plates that we now have at our service that we have any necessity to work at such an aperture as *f*/4, not to mention the greater apertures that most portrait lenses put at our disposal, and in the second place there is a law in optics—explained in these columns some years ago—whereby the limit of actual (not angular) aperture remains the same for the same subject, whatever be the focal length of the lens. Experience has convinced us that three inches, or perhaps three and a

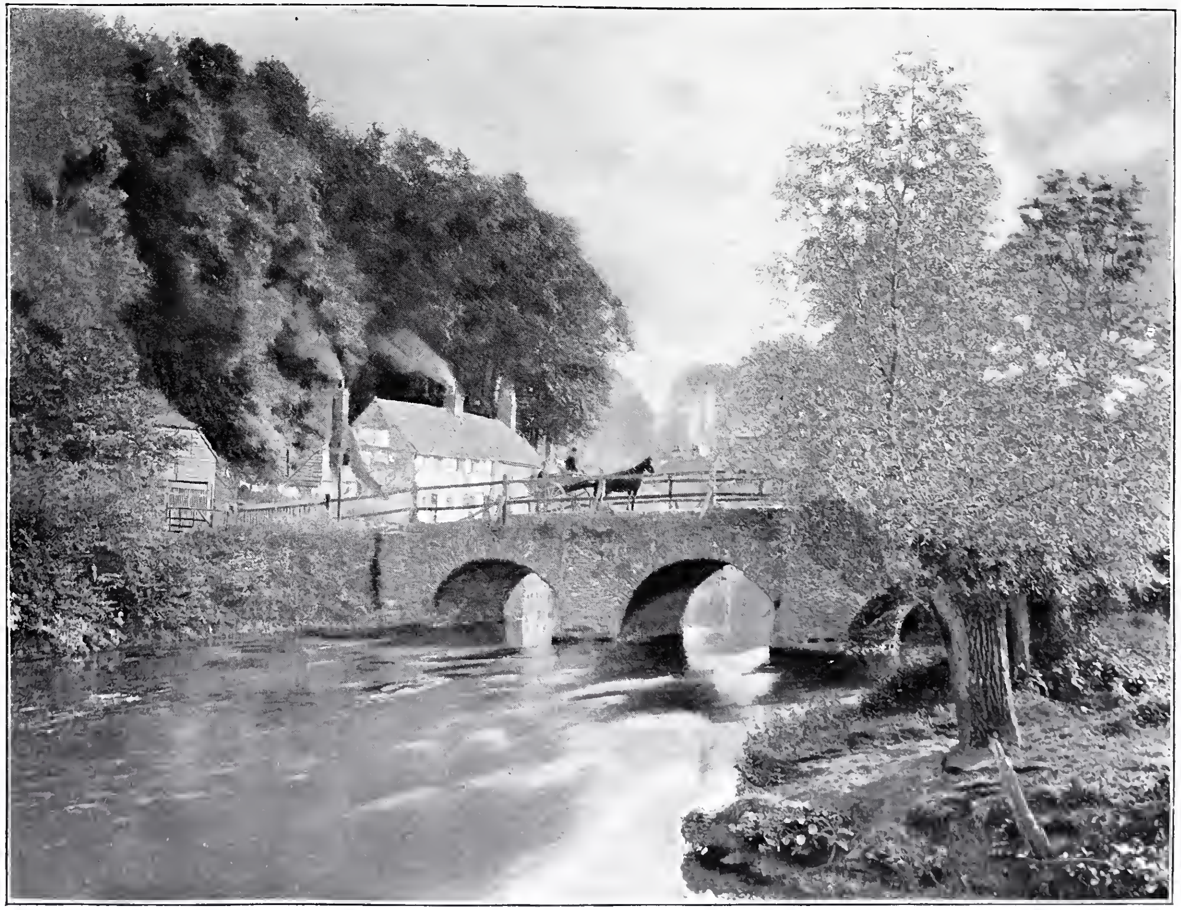
ON THE HUDSON BY LYDELL SAWYER

half inches, is the maximum useful aperture in portrait work.

This means that there is no use for an aperture of *f*/4 for lenses of more than twelve, or, at the outside, fourteen inches focus, that is to say, for lenses that *ought* not to be used for plates much larger than 6½ x 4¾ in portrait work. This consideration brings us very directly to an important point. The lenses of the kind commonly sold as "portrait lenses" have distinct advantages for the everyday carte-de-visite and cabinet work of the professional photographer for some subjects and in some weather. For sizes at all larger they are of doubtful advantage; for sizes much larger they offer no advantage at all, but, on the contrary, most of them have distinct disadvantages.

Who at the present day, we wonder, uses a portrait lens of, say, six inches diameter with a diaphragm of a greater diameter than three inches? Yet it is not everyone who knows that, such being the case, he would be better fitted with any of several kinds of lenses having a maximum aperture of about *f*/8, and being much cheaper than a portrait lens in first cost.

When we last wrote on this subject there was practically no lens in the market with aperture between *f*/4 and *f*/8, now the gap is fairly filled, *f*/5.6 or *f*/5.7 being by no means uncommon, whilst *f*/6.3 is a favorite maximum aperture with makers of the newest forms of lens. 6.3 is practically twice the $\sqrt{10}$; this last having been proposed as the unit for angular apertures of lenses by Dallmeyer, and having been adopted in the factory of which he is the principal. For sizes not greatly larger than cabinet there can be no doubt that these are the best lenses for portraiture, even if they are not actually named portrait lenses. There is, however, a danger in connection with their use. The very fact of the extraordinary covering power possessed by many of the new forms of lens leads to the use of them for plates far too large, or, what is the same thing, leads to the use of lenses of much too short focus. Thus we discovered a photographer a few days ago using a double anastigmatic of only twelve inches focus for portraits on a 12 x 10 plate. He explained that "even full aperture it covered well enough for portraiture up to the very edges of the plate." Of course, this was an extreme case, but it seems difficult to make photographers in general understand that, for such a size of plate, a lens of *at least* twenty inches focus



LANDSCAPE STUDY

BY SEYMOUR CONWAY

should be used, and this absolutely without regard to any statements of the size that the lens *can* cover.

There is an excellent old rule as to the focal length that should be adopted for any size of portrait to avoid exaggerated perspective. It is that the focus should be not less than twice that of the length (or height) of the final picture.

This is, however, the focus *in use;* very nearly the same as the solar focus for lenses of short focus, very different for those of long. Thus a lens of twenty inches solar focus is never likely to be used for portraiture with a less conjugate focus than twenty-two or twenty-three inches, that is to say, about twice the length of a trimmed print likely to result from a 12 x 10 negative.

Above a certain size the single lens becomes not merely admissible, but the best for portrait work.

A single lens gives no appreciable distortion if the rule as to focal length given above be strictly observed. Single lenses are now made that give perfect definition at apertures of *f*/12 or *f*/12.5. Such a lens with a focus of thirty-six inches or somewhat over, and an aperture of three inches will be found better than any other kind of lens for a plate of such a size as 22in. x 17in., for it is unlikely that such a lens will be used with a less extension than forty four inches.

We thus have it, to put it as briefly as possible, that :

Portrait lenses are the best (or have advantages over others) for small work.

The various kinds of rapid doublets—anastigmatics, etc.—are the best for moderately large work.

Single lenses are the best for very large work.

We are here assuming that absolute sharpness is desired in at least one plane. If not, single lenses have advantages for all sizes, the aperture being opened sufficiently to give distinctly appreciable spherical aberration.

Again, for large work, the Dallmeyer-Bergheim lens has distinct advantages, especially as it gives us the power of varying the focal length within very wide limits. When first we worked with this lens we found some difficulty in making the necessary adjustments, but when we had overcome this we found it a most useful instrument.—*Photography.*

ACTION OF THE BROMIDE RETARDER IN DEVELOPMENT.

BY C. WELBORNE PIPER.

An alkaline developer necessarily contains a reducing agent capable of removing the halogen from a silver haloid salt, which reagent naturally has a more rapid effect upon a subsalt containing a smaller proportion of halogen. It is, however, necessary to so modify the reducing power of the developer as to render it incapable of producing any effect upon the normal salt in the unexposed non-image during the time necessary to develop the image, hence the normal salt in the exposed particles —which contain both normal and subsalt—cannot be reduced directly by the developer, but only indirectly, as the result of the reduction of the subsalts with which it is in contact. That is to say, the metal reduced by the developer from the subsalt, in its turn, abstracts bromine from the adjoining normal salt, and converts it into subsalt.

In effect, therefore, the first result of development is a gradual increase in the quantity of subsalt, and this action probably continues until the whole particle is partially reduced, whereupon continued development causes the permanent reduction of metallic silver.

The rapidity with which a particle is completely reduced depends upon the initial relative amount of subsalt it contains as the result of exposure ; or, conversely, the slowness of its reduction depends upon the relative amount of normal salt in contact with the readily reducible subsalt. If then we introduce into the developer a soluble haloid salt from which the nascent silver may abstract halogen as well as from the normal salt, the reduction of the latter, and consequently of the whole particle, may be further delayed, the effect being proportionately much greater in the case of a slightly exposed particle, containing only a small proportion of subsalt, than with one more fully exposed and containing a larger amount. Here we have an explanation of the temporary retarding effect of a small quantity of bromide upon development and of its tendency to increase contrast. In excess, however, the bromide may have a restraining effect, for it may prevent the permanent reduction of metal and so lead to a lack of density in the fixed image.

If a very large excess of bromide is added to the developer when development is fairly advanced, some of the work already done is destroyed, probably because the metal produced by the further reduction of the existing subsalts reacts with the bromide to form a normal salt. This effect is most obvious if the greater portion of the developer is poured off the plate and the dish is filled up with with a plain bromide solution. The finer shadow detail is completely destroyed and is incapable of further reduction. This result of the continued action of the developer in the presence of a large added excess of bromide may be looked upon as analogous to the effect of solarization produced by the continued action of light in the presence of the continually increasing quantity of freed halogens.

As the effect of bromide varies with the relative quantity present and inversely with the reducibility of the particles, a certain quantity may act as a restrainer in the weaker parts of the image, and simply as a retarder in the others, in which case it must affect the scale of the gradation.

The retarding effect of a plain solution of bromide applied before development may be attributed to the formation of double salts not readily reducible, and possibly the effect of bromide in preventing the direct reduction of the unexposed non-image during development may be explained in the same way. The reduction of the particles in the non-image may, however, be brought about in the absence of any bromide, otherwise than by the direct action of the developer.

In a gelatine film the different particles being isolated from each other are developed individually, and each upon its own merits, as we may express it, the image being thereby preserved; but, to a certain slight extent, and under certain conditions, it is possible that reduction may spread from the image to unexposed particles in its immediate vicinity. The gelatine separating the particles of course becomes impregnated with the developer, and if this contains a bromide salt then the nascent metal in any particle undergoing reduction, instead of attracting bromine from an adjoining unexposed particle, abstracts it from the intervening haloid as the nearest source.—*The Amateur Photographer* (England).

A DAUGHTER OF THE PEOPLE BY R. E. M. BAIN

THE BELLE OF STAMBOUL BY ROBERT E. M. BAIN

A New Photographic Telescope is being made for the observatory of Cambridge University, England, by Sir Howard Grubb, and the building for its accommodation will be taken in hand this year.

BACKED PLATES.

One of the most surprising facts in connection with the practice of photography is the dense conservatism characterizing the modes of working of a large number of both professionals and amateurs. Take the now ubiquitous dry plate itself. How many years were they not advertised, and of good quality too, before any, but a small band of workers made any use of them? It is true they were advertised at so much per square inch, and their price at that time was far beyond the present exceedingly low rate, hence economy might be said to stand in the way. But such an excuse would be based on false premises, for the simple reason that a large proportion of the best wet-plate men always used patent plate, the price for each piece of this glass being more than double the sum now paid for glass and film combined. Let us take again, the use of sulphite of soda with the developer. It is difficult for later-day workers to understand how photography was carried on without sulphite, yet such was the case, and it was some years after Berkeley introduced it into photographic practice before its true value was appreciated or its merits known. Finally, let us examine the history of backed plates, because it is far more than a quarter of a century since it was discovered that by "backing" the plates of that day with a suitable substance the effect termed halation was either entirely eliminated or reduced to a minimum.

In consequence of this discovery, some of the dry plates then made were sold ready-backed. There was, however, never a large sale, and some time before the advent of gelatino-bromide, the Hill-Norris plates held the field. Then came the era of gelatino-bromide, and the backing of plates fell into desuetude. After a while, the need for a remedy for halation became talked about, and the old idea of backing came to the fore. A few wise ones put it into practice; but to this day an immense majority of workers never employ it, partly, no doubt, through ignorance, partly through supineness, partly through the dogged conservatism we speak of.

For many years past we have, in season and out of season, referred to the subject and insisted upon its necessity. We should like to point out that we have shown, and would still continue to show, that there is great usefulness in plate-backing in a far larger number of cases than those gross ones instanced so often when taking views with dark objects cutting against the sky, or interiors with brightly illuminated windows. The effect of the reflection at the back of the glass is there plainly visible in "halation" effects; but, in taking a portrait, for instance, a similar effect of reflection must be operative and degrade the half-tones, though it might be difficult to place the finger on the spot, as with halation proper.

It is not to be supposed that backing has been in all cases, and with every one, a mere occasional fancy, for we know, at any rate, of one instance where a well known professional has had a dark room fitted up specially for the purpose of plate-backing, he, no doubt, finding that to do it under ordinary dark-room conditions was running too much risk, either of accidental spoiling of the plates by thoughtlessly admitting actinic light, or by the light found sufficiently safe for a few minutes needed to develop being actinic enough to fog plates exposed a sufficient time for the backing to become dry. Such work, however, becomes a heavy tax upon the time of the experienced hand, and it is a subject of some congratulation to us that our labors appear at least to be fructifying in a direction to save this waste of time. For some years past one firm of plate makers, who make a plate of great excellence, but not perhaps in such large quantities as some of the great establishments, has always listed plates ready-backed, and now their example is being copied by others, or our teaching is bearing fruit, it matters not which. We think it probable that the time is not far distant when all plate-makers will stock ready-backed plates. Some years ago we described a simple mixture for backing, which any one could make, and the materials for which were always at hand; nothing could excel it for the purpose; but, so long as the backing is efficient, we have no feeling in the matter as to what form it takes. But there is one very important point to be considered in the choice of a backing, on which we desire to lay some stress—the facility with which it can be removed. For simplicity, ease, and cleanliness, none can surpass that of the firm we referred to; it is simply black paper suitably attached, and it peals off shortly after the plate is placed in the developer, and before the development is complete. Next we come to a pigment applied in conjunction with a suspensory medium of refractive index near to that of glass, this being the method recommend by us in these columns. When an unsuitable medium

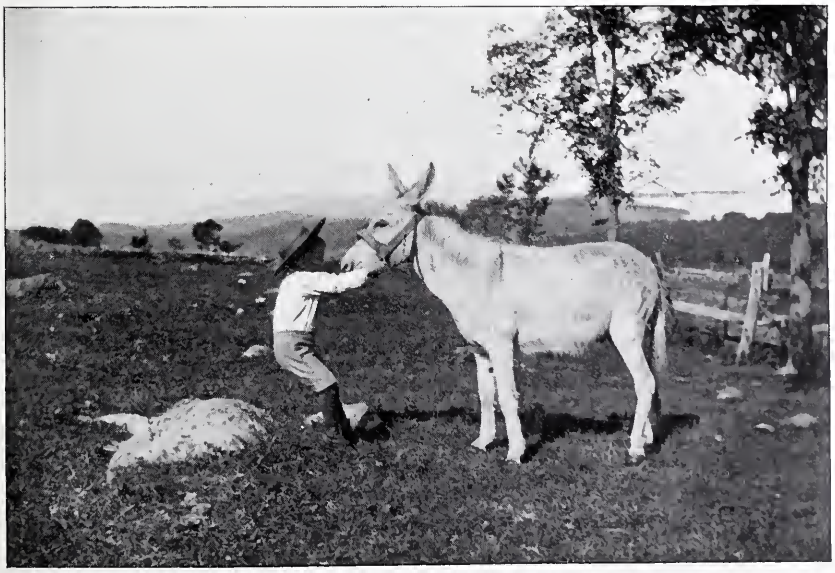
IN DAISY TIME BY ALFRED CLEMENTS

is employed, it may be too difficult of removal, or too tacky, through excess of glycerine, to admit of convenient handling. These points should be well considered.

Finally, we come to the plan recommended many years ago by Captain Abney—the use of a collodion colored by aurine and magenta or other suitable dye. This plan is very effective, but is has a great drawback. It is adopted by one large firm who list certain of their plates ready-backed (in this manner) at no increase of price. A correspondent, writing on the subject, complains to us of the immense amount of labor needed in getting rid of the backing.

He tells us that on Jubilee Day he took a number of large plates so backed, which he desired to print from at once; but, when he came to removing the coating, he found it absorbed such an immense amount of time that he could not get his prints through, and the annoyance it created was so great that he found the English language insufficient to express his feelings. He tried scraping it with a knife, and so filled the air with fine particles of dye that he ruined a number of prints that were exposed to dry by irretrievably dyeing them. He tried methylated spirit and ether, and dyed his hands all over. He used a knife to it while wet, and found half an hour a plate not enough time to give to the work.

In conclusion, we can only say that, though backing, even the best, is no certain cure at all times for halation, it is so great a palliative that no one should attempt outdoor or interior work without backing his plates by one or other of the plans we have described.—*The British Journal of Photography.*



THE TUG OF WAR.

(*Briggs Kilburn Adams and his Donkey*)

HINTS ON PHOTOGRAPHING POLISHED SURFACES.

Evidently the photographing of highly polished surfaces presents difficulties to some, if one may judge from the number of queries that are continually being replied to through the Answers column; but there is really very little difficulty in the way if a few simple expedients be resorted to. Suppose, for example, a group of plate has to be photographed, some portions of which are highly burnished, while others are frosted or matt. The most common, and, on the whole, perhaps, the best way of dealing with it is to take a piece of tolerably hard putty, and with it evenly dab or stipple over the bright portions of the metal; it will dull the surface, and thus prevent reflections—

the only source of trouble. After the photograph has been taken, the putty can quickly be cleaned off with a plate brush charged with whiting and a little benzole.

Another plan, which is frequently adopted, when photographing cups, vases, and the like, is to moisten the atmosphere of the studio, either by sprinkling the floor with water, or by means of a scent sprayer, and then placing a lump of ice in the vessel. The moisture in the room then condenses on the cold surface of the metal, and thus renders it dull and non-reflective. When this method is adopted, the precaution must be taken that everything is ready for the exposure being made before the ice is introduced into the vessels, as the moisture condenses rapidly on the cold metal, and soon collects in sufficient quantity to run down the sides in tears. After the exposure is made the ice should at once be removed, in case a second negative has to be taken, in which case it can be reintroduced, when the moisture will condense afresh. We are here assuming that the articles to be photographed are such that ice may be put into them, but that is not always the case; still advantage may be taken of the condensation of moisture by simply keeping them for some time previously in a cold place; then, when they are brought into a warm or damp atmosphere, condensation will take place.

ON THE WANDLE BY J. CARPENTER

There are cases, however, where the owners of the plates will neither allow the putty to be employed nor ice to be used. Then the difficulty of the photographer is increased, but with judgment it may be overcome. He must now depend entirely upon the illumination of the objects, and that alone. The main thing is to so light the subjects that there are no reflections from them in the direction of the lens. As the angle of reflection equals the angle of incidence, it is obvious that all front light must be stopped off, and only a side light used, so that all the reflections are away from the camera. The light falling on the objects should be as concentrated as possible, and if there are any deep shadows—and there will be if the highly burnished portions are in shadow, as then they will appear nearly black—they may be softened by means of a reflector, care, of course, being taken that none of the light from it reaches the lens. The best angle of light for most subjects will be about 45 degs. That angle will be found to show the chasing or engraving very clearly, but a more direct side light will often do so still better.

The development of the negatives should be done tentatively, so as to get out all the detail in the shadows before density is obtained in the lights. Very often, besides the chasing, there is an inscription, and, in the case of a presentation plate, it is imperative that it be distinctly rendered. Here, again, a strong side light is an absolute necessity, for, unless one be used, the inscription will not be readable in the photograph. Here is a dodge that many do not know of. It is this: Take the article or the inscription plate to a copper-plate printer, and get him to fill in the lettering with ink, as if he were going to print from it. As the letters will now be in black ink, the inscription will be very distinct in the photograph; the ink can afterward be removed with a little benzole or turpentine.

One thing to be specially avoided in photographing plate is under-exposure and a forced development, which are the most common faults in photographs of plate. The exposure should always be timed for the shadows, and not for the lights, as is too frequently the case. In photographing any bright objects, a great advantage will accrue from the use of backed plates.

Copying Daguerreotypes seems to be a difficulty with some, but these pictures are really very easy to copy if we keep in mind the fact that the angle of reflection and the angle of incidence are equal; hence, if all front light be avoided, and the picture illumed by a side light only—say an angle of 45 degs.—an excellent reproduction will be obtained.

Bright machinery has often to be photographed, and sometimes where it is very unequally lighted. The only thing to be done under these conditions is to paint over the polished portions, or, better still, the whole machine, with flatting color. This most engineers now do who have their machinery photographed. The flatting color is readily cleaned off with benzoline or turps, and a pledget of cotton waste. Usually the maker's name is on the machine, and it is important that it shows very distinctly in the photograph. As the letters are usually in relief, it is a good plan to just whiten the surface of them with a piece of chalk.

In photographing tombstones or monuments—say of polished granite, with the letters in gold—it is sometimes difficult to get the inscription distinct, even when it is illumed by oblique strong sunlight. The best thing to be done in a case of this sort is to make up a stiff paste with whiting and water, and then fill in the letters with it, using a palette knife for the purpose. After the photograph has been secured, the whiting can be quickly removed, either by brushing it out dry or by washing it out with water.—*The British Journal of Photography.*

LARGE OR SMALL SIZE?

THERE is an old Yorkshire saying with regard to horses that "a good big 'un is better nor a good little 'un," and whilst we are ready to admit that the Tyke knows more about quadrupeds than canvasses, still we think the same rule applies to pictures, including, of course, photographs.

In the consideration of this question we think we may reasonably be guided by the practice of the painters, because experience and study bestowed on every point of their art has settled certain fixed rules, and because, though they may not like us to say it, our objects are the same as theirs. Granting this, can any one of us call to mind a well-known painting so small as the usual size produced and exhibited by photographers?

Personally we have failed to do this either in home or foreign collections, and the smallest great picture we can remember exceeds the whole plate size.

Even the painters who delighted in diminitive panels or canvasses—say Gerard Douw among the old and Meissonnier among the modern masters—never, to our knowledge, painted as small a work as the size we have suggested, and although their methods and style of expression suggested the viewing of the picture at close quarters—they may properly be termed cabinet painters—yet the measurements were generally nearer 12 x 10. To our idea a certain increase on the present size of our prints is necessary to show the actual qualities of the work itself. It is all very well producing work which one's friends, or the critics (some will say the two classes are synonymous, and some not), call "a little gem"—"full of quality." It is so small, say 3 x 2, that it need not hold very much to be chock full up to the brim; but it is primarily intended to be seen and enjoyed by the eye, and the former is just possible, whilst the latter is quite out of the question considering our focal arrangements have to be abnormally screwed up to view it.

Some one has said that one of the qualities of a picture should be that it seems like a view of nature seen through a window, that a wall hung with pictures should be as though their fortunate owner could look from his room on various aspects of nature itself, as seen, of course, through the temperament of other men. Thanks, however, to the abolition of the window tax, we are no longer limited in this respect, and unless keyholes are the means of view there is a popular prejudice in favor of a larger aperture than 3¼ x 4¼, or 5 x 4, or even 6½ x 4¾.

Again, too, it is one of the fundamental necessities of artistic criticism and appreciation that the eyes, when once directed on the object, should rest there without interference from outside surroundings—for this reason is the frame or mount—but it is impossible to do this on the smaller sizes.

In the most successful small-sized photograph such success is gained generally by attempting to rival the miniature painter—and this is impossible owing to the difference in material and process. Some Lilliputian works, it is true, have been treated in a large manner, and their success has only created a wish that the worker had not limited and handicapped himself and his work so unnecessarily.

Probably the reason of the state of affairs is the question of convenience and economy—convenience and handiness in the production—economy in the materials required. And, on the surface, these are practically very good and strong reasons, but theoretically, and, when we examine them below the surface, they are absolutely bad, and merely excuses created by expediency. "Oh," says the amateur, "I can't carry a 12 x 10 about all day long, and I can't afford plates at 16s. per dozen." This is perfectly true, but is it necessary to follow both or either of these courses?

If every picture which is projected was ultimately worthy of completion, then we certainly should say both contingencies were necessary, but then the happy producer would probably be in a position to use his carriage and pair, or even four-in-hand, to drive him to the *locus in quo*, and plates would be a mere trifle against his banking account in spite of the limited discounts. But, unfortunately for us and our art, and the world generally, every picture which is initiated does not seem, even in our fondest and most enthusiastic moments, a fit legacy for posterity. With the best workers there is a limitation of results, owing to the fact either that they make few exposures or that they do not hesitate between their shelves and the dust-bin.

But the exhibition walls of the last two years show that the question of size is being considered, and last year's autumn shows were distinctly a move in favor of large work. From what we hear, too, the coming year will see an even more pronounced determination against the limitations of inches, due, probably, to the large adaptation of rough surfaced papers, the belief that insistent detail is not in all cases necessary to the picture, but may be sacrificed in some instances to breadth and general effect, and more than all, to the fact that slowly, but steadily, photographic work is, in spite of the rabid enthusiasts on both sides, assuming a place among the pictorial arts.

For these reasons it is worth while each worker considering whether the limitations of the size of his plate have been allowed to affect his final work, and whether such limitations should not be avoided in a process in which there are so many unavoidable ones. That they can be so avoided by the exercise of a little further trouble is an axiom that applies to the majority of our difficulties, and here are some suggestions we venture to make:

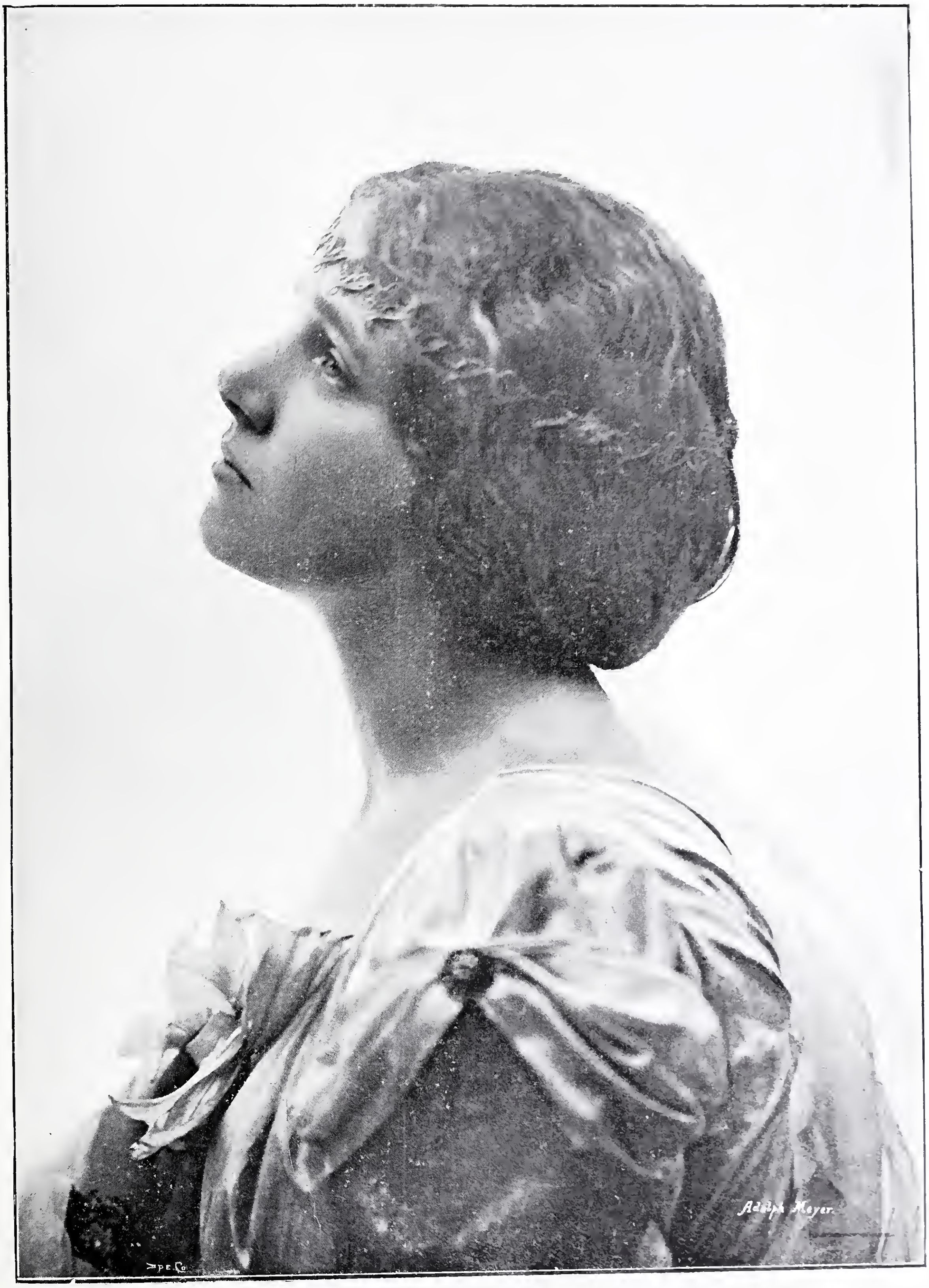
If a large-sized camera is used, two courses are open—either to choose the view previously, settling by observation the character of lighting, atmosphere, accessories necessary, and then, having these in existence, make the exposure, and come straight home; or to learn to exercise that power of restraint—theoretical only, alas! with most of us—which will enable one to take out six virgin plates and return with them undefiled if no suitable subject has presented itself. Happy is the photographer who can resist temptation!

If, on the contrary, the smaller sized camera is the favorite, there are many ways within the reach of all of us to secure an enlargement.

If the successful negative is chosen and a transparency carefully prepared from it on a slow plate, and with every effort to obtain full gradation and avoid blacks or whites, from this, after repairing all mishaps, an enlarged negative can be produced with the aid of only the outfit which was originally used. I have lately seen some enlarged paper negatives made by an amateur who has little time to give to photography by fixing his camera to a hole cut in the shutter of his dark-room cupboard, and having placed a glass transparency where the focusing screen was, and then printing the bromide paper—ordinary bromide in this case—on a board in front of the lens. But Wellington and Ward make a special bromide negative paper at a speed of, say, Ilford Rapid, which is almost grainless, and does not require oiling before it is printed from. Nothing can be better for this purpose than an ordinary attic skylight, for the paper, mounted on a board, can then be put on a stool or table or the floor so as to get the exact distance.

Paper negatives are unbreakable, are easily stored, and are very simple to subsequently work upon. If one were a millionaire (we have yet to discover the photographic variety, and we do not see it possible for him to exist), we would suggest making an enlarged transparency from the original negative, and then the final negative, but this would mean the additional cost of a large-sized plate. In any case during the progress one would have ample opportunities of modifying to one's wish, of retouching and shading and masking, and the fact that one can do it quietly in the worker's own dark-room should guarantee a fine result at the finish.

And writing of modifying, we wonder why, when a negative is obtained from the camera which is unsatisfactory, by making from it a transparency and then another negative, using


Adolph Meyer.
DPE Co.

Parkstrass & Presden Engraving Co.

PORTRAIT STUDY
BY ADOLPH MEYER

the developer for each with brains, more "wastrels" are not saved. But that, as Kipling says, is another story.—*Photography.*

THE JOLY COLOR PROCESS.

Every photographer has at sometime longed to be able to fix the colors of objects so that he would have a photograph showing what is seen upon the ground glass of a camera. This fifty-year dream of the photographer has, after many attempts and failures, at last been realized by Professor John Joly, of Trinity College, Dublin. Dr. Joly's method is very simple in so far as it concerns the photographer. All that is needed, beyond what is now employed by the photographer, are two screens. One of these, called the "taking" screen, is of a greenish or yellowish-green hue to the eye, and is placed in the camera directly in front of and in contact with the orthochromatic plate. This "taking" screen consists of a plate of glass, on one side of which are fine lines of orange, yellowish green, and blue color in alternation. These lines are sufficiently fine to blend or be unobtrusive to the eye, and are some two hundred or more to the inch. The exposure is made slightly longer than usual with the same quality of plate, and a screen for preventing the action of the ultra violet rays of the spectrum is used. The negative is developed as usual, and the positives are printed upon glass or other transparent support in the ordinary manner. Both negative and positive have the appearance of lines of light and shade, this being due to the filtering action of the lines upon the "taking" screen. The photographer now places upon the positive the second, or "viewing" screen, which is provided with lines transmitting red, green, and violet; *i. e.*, such light as will excite the fundamental color sensations. This screen is placed line upon line of the positive in such wise that the red lines come over those lines of the positive which correspond to the lines of the negative taken behind the orange lines of the taking screen, and so also of the green and yellow-green lines, and the violet and the blue lines. Upon holding the two plates, photograph, and "viewing" screen, against the light, a photographic representation of the object in its natural colors, or in colors seeming such to the eye, is had. The color photographs may be projected upon screens by means of the lantern, or they may be framed and hung in a window, or be put in albums.

It is to be borne in mind that the "taking" screen cannot be used for both taking and viewing the photograph, for then the fundamental colors, red, green, and violet, and all derivatives therefor, cannot be obtained. Also, the "viewing" screen cannot be used for taking and viewing the photograph, for then the intermediate colors (the oranges, yellows, and blues, as well as the purples), will be very inadequately reproduced; in fact, they are practically absent. The reason why the "taking" and "viewing" screens are not interchangeable is that the linear areas of the photographic negative must register the color values of the object accurately; this requires that the greatest photographic action shall be in the orange, yellow-green, and the blue regions of the spectrum; hence, the "taking" screen is provided with lines in orange, yellow-green and blue colors. Coming to the combined positive and "viewing" screen, it is a matter of putting together such amounts of the fundamental colors, red, green, and blue-violet, as will properly synthesize, or make up, or match, the colors of the original object. It is well known that the eye is unable to distinguish between the yellow of the spectrum, and a yellow formed by mixing proper amounts of fundamental red and green light; the same is true of the spectral blue and a blue formed by mixing proper amounts of the fundamental green and blue-violet; and what is true of these colors, yellow and blue, is true of every other color of the spectrum.

These who are interested to pursue the scientific side of the subject further will find *Young's theory* of color vision *in extenso* in Chapter 9 of Rood's *Text Book of Color*, and also in Abney's book on *Color Vision*. The color value or density curves are on page 104 of Rood's work.

THE WASHING OF GELATINO=CHLORIDE PRINTS.

BY A. V. KENAH.

THERE seems to be a very great deal of doubt still in the minds of photographers, especially among those who do not read up in the yearly almanacs and papers the recent researches of those who make it their duty to probe and dig into the inner recesses of the mysteries attending photography, on the time it takes to wash a print. I have particularly noticed this of late when in this paper I have seen so many photographers explaining their methods of washing prints and the contrivances which a great many recommend. A large number of these latter show much ingenuity on the part of those who construct them, and, as such, deserve praise, but after all, they are not necessary, as I intend to show if you will only take the trouble to read this article.

One of the greatest authorities on the washing of prints is Mr. Haddon, who has investigated the subject very thoroughly, and who has published some of his results in the *British Journal* for 1897. There are, consequently, a very large number of you who are acquainted with his researches, and who probably have greatly benefited by them. It is, however, for those of you who have not read Mr. Haddon's paper which he delivered to the Convention, that I am now, by his kind permission, re-writing his interesting results. He writes:

"When dealing with the question of washing prints, three questions have to be answered—

"1. What must be the ratio of the volume of water to the area of paper to be washed?

"2. How long must the prints be allowed to soak in each quantity of water?

"3. How many changes must the prints be subjected to?"

The actual tests were made on albumenized paper in preference to gelatino-chloride, as the latter is usually so loaded with barium sulphate that it is difficult to obtain clear solutions by filtrations through paper, especially when treating the ash of the burnt paper with ammonia. But what applies to albumenized paper equally well applies to gelatino chloride. The first thing to be decided was the ratio of the volume of water to the area of paper.

1 c. c. per square centimetre of paper, *i. e.*, roughly, about 1 fluid ounce of water to every 4½ square inches of surface to be washed, was settled on. After the prints had been fixed the requisite time, they were plunged and separated from each other as rapidly as possible into the measured quantity of water. After soaking for five minutes, two pieces were taken out and dried, the remainder being transferred to another dish, with the quantity of water diminished in proportion to the area of the paper removed.

This operation was carried on till the last pieces received ten soakings of five minutes each in ten different changes of water.

A portion of each washing water was set aside for testing with permanganate of potash, iodide of starch, and sulphuretted hydrogen dissolved in water.

It was found by experiment that one drop of each of the solutions of permanganate and iodide of starch produced a distinct coloration in a test tube, filled with water, 6 inches long when looked through lengthwise at a sheet of white paper.

In order to ascertain when the hypo had done its work, such a number of drops of the reagents were added to the water in similar test tubes so as to just match the tints in the test tubes filled with plain water and one drop of the reagent. The number of drops required in each case, and the amount of silver left after each washing, will be found in the table below. The ash was then treated as is usual in such operations, the precipitate was then collected and weighed, and the silver estimated in the ordinary way.

The following table gives the results obtained:

Change of Water.	Silver in ¼ Sheet.	Number of Drops of		Sulphuretted Hydrogen.
		Permanganate.	Iodide of Starch	
1	·0055	More than 10	More than 10	Brown color
2	·0045	More than 10	More than 10	Faint tinge
3	·0040	2	3	No color
4	·0040	1	1	"
5	·0044	1	1	"
6	·0042	1	1	"
7	·0044	1	1	"
8	·0040	1	1	"
9	·0043	1	1	"
10	·0040	1	1	"

These results show that after the third washing the amount of silver becomes constant, and that further washing has no effect as regards reducing the quantity of silver left in the paper.

It will thus be seen that it is not necessary to wash prints for a long time; in fact, long washing only softens the paper and makes it stick when trying to glaze it, and also tends to discolor the whites. One of the simplest ways I know of to wash prints is to cut a groove in a cork and place it in the waste pipe of sink; turn on the tap and regulate the inflow until it equalizes the outflow; keep the prints moving all the time, and fifteen minutes will be found to be ample for their thorough washing. The advantage of this method is that the supply salts are taken away from the bottom, and a constant soluble of fresh water is given to the prints. This method is, of course, only applicable where there is running water. In cases where this is not to be obtained, several changes and keeping the prints moving all the time will be found to answer the purpose just as well.—*The Photographic News.*

Insoluble Carbon Tissue.—Kastner states that carbon tissue which has become insoluble on the surface may be rendered fit for use by floating the paper films downwards on hot water, by which means the insoluble film floats off, and the tissue should be immediately immersed in cold water, and squeegeed down to glass or ferrotype, again sensitized and dried. He states that this gives absolutely pure whites, and the small quantity of film removed has no effect on the intensity of the image. —*British Journal of Photography.*

THE USE OF THE SWING=BACK—A CHAPTER FOR BEGINNERS.

BY REV. A. H. BLAKE, M.A.

IT is necessary that the beginner should thoroughly understand the powers which are placed in his hands by the judicious use of the swing-back. Many might be inclined, in purchasing a camera, when expense was an object, to ask, "Why have a swing-back at all, can we not just as well dispense with it, seeing that excellent photographs can be taken without it?" So indeed can excellent photographs be taken without a lens, but we cannot therefore always dispense with that useful and necessary part of the photographer's kit.

Let us imagine first of all that we are required to take a building or a church. We find on placing our camera in position that, though otherwise all is as we desire it, the upper parts of the building or the church tower are just cut off. This will never do, so the rising front is lifted as far as it is possible, and yet the whole church is still not included on the screen.

What is now to be done? It will be necessary to tilt the camera until we get in the whole of the building.

Now, again, considering the image on the ground-glass, we find that though we have been successful in getting the whole of our subject in position, yet the doing so has had a disastrous effect upon the parallel lines of the building, giving the walls a V-shaped appearance, and the whole conveying to the mind an idea of extreme instability.

By what means should we remedy this fatal defect?

Take the ground-glass in hand, and swing it backwards and forwards until the lines resume their vertical appearance; in this way it will be found that all convergence has been successfully removed.

A very useful little instrument is to be obtained which, placed upon the side of the camera, will indicate when the ground-glass is vertical.

But now another difficulty meets the beginner. Parts of his building are not in focus, and so matters are still far from satisfactory; but the insertion of stops till the desired sharpness has been obtained will obviate this difficulty.

But it is not only in architecture that the swing back is of such great use. The landscape worker will find it a great addition to his powers in the field, especially in relation to foreground work.

A good foreground is very essential to the success of a photographic picture, but it will often be found that to get the foreground and distance in proper focal relation to each other is not easy.

Suppose there be few straight lines in the composition, it will be found quite possible to move the swing-back in such a way that the foreground and distance can both be got fairly into focus together without the use of a small stop.

This has two advantages, the first being that the smaller stops destroy atmosphere and seem to glue all the different planes together, and the other that we can still give short shutter exposures if necessary, which would be difficult perhaps with strong foreground subjects stopped down when there is movement of trees, or water, or quick-drifting clouds blown by the wind across the heavens.

But we have left ourselves scant space to speak of the use of stops, which the little perforated metal disks supplied to the beginner with his lens are called.

Stops are of three kinds—the "Waterhouse" stop, which is a metal disk supplied with lens and inserted into a slit in the brass-work of the lens between the glasses. A second kind, called "rotatory" stops, have a revolving disk, with the various sized perforations in the brass work; while the third kind, called "iris" diaphragm, consists of plates overlapping one another and making the aperture larger or smaller as revolution takes place.

The stop performs several offices; it enables different planes of the picture to be brought into focus at the same time, and it also causes the picture to be quite sharp, even to its extreme edges. We do not say it is desirable to use this power placed in our hands on all or even many occasions, as beginners are very apt to do, but we ought to know what power we have and we can then intelligently use it as we have occasion.

The smaller the stop used, the darker, of course, grows the image and the longer the exposure, it being taken as a guide to exposure that each smaller stop increases the exposure twofold.

Should the beginner feel uncertain as to what is meant by the use of stop to bring planes into focus, by the following experiment he will easily find out.

Let him place a group of figures some little distance, say twenty yards, from a bank of trees and shrubs. Let the figures be dispersed thus: some sitting on a rug on the ground, some sitting on a bench behind these, and others standing somewhat further back still behind these. There will now be four planes or distances in the picture—the row sitting on the ground, the row on the bench, the standing row, and the trees and shrubs in the background.

It will probably be found that if the first row be focused, the back row will not be sharp and the background quite astigmated; if the background be focused, the figures in front will be, on the other hand, quite indefinite.

Now let us focus the row standing up until we get them quite sharp, and then proceed to place *f*/11 in the slot; if this be not successful to bring all into focus, then *f*/16, and so on until all the rows of figures and the background are quite sharp.

We have not here discussed the question whether it is desirable that the background should be sharp in such a case, but only used the group as an illustration to explain the action of stops in sharpening up several planes at once.

It is far better to focus thus for the middle distance and so sharpen the distance and foreground at the same time, than to focus the foreground and sharpen up the distances from that, and manifestly a smaller stop will suffice for our purpose, which is a consideration when there is movement possible in figures or foliage, which might spoil our picture.

The same remark applies if you have to tilt the camera and use the swing-back as mentioned above to get in the whole of a building, so that the top and bottom are greatly out of focus.

In a case like this do not try to get the top or the bottom sharp, but the center, and gradually sharpen top and bottom at once by the introduction of stops, in which way you will manage with a much smaller one than you otherwise could, and decrease, consequently, the necessary time of your exposure.

There is another movement which is not found in many cameras, nor often used, called the side-swing, by which without the use of stops we can do the same sharpening of objects which are out of focus across the picture as we can with the swing-back when they are the upright way of the camera. If you have it so, use it; but if you have not got it, you need not regret it.

It ought not to be taken for granted that if a subject be fairly sharp the introduction of a very small stop will necessarily give extreme sharpness. It will be found in practice that it will often throw out the existing focus, so that the picture should always be well examined after the introduction of the stop and before the plate is exposed.

The earnest landscape worker will soon find what power these two adjuncts to the camera place in his hands; how he can accentuate and suppress focus, sharpen or throw into indistinctness various portions of the picture as his taste and judgment dictate.

He will find that the more he is accustomed to the use of these helps the more power will he get out of them to vary his results to suit his artistic judgment —*The Amateur Photographer* (English.)

PLATINUM PRINTING ON FABRICS, PLATINUM TONING, etc.

BY E. A. ROBBINS.

The platinotype process can be very easily applied to the production of prints upon such fabrics as silk, linen, and satin. These should, of course, be free from grease and from dye (which might undergo a change in the acid bath), and wood can be sensitized and used for various decorative purposes. In the case of fabrics sizing is required, as in the case of paper, to prevent the sensitising solution from sinking into the substance of the fabric and so producing dull or flat pictures. The fabric is most conveniently manipulated by being stretched upon a frame of wood, which should be well varnished with shellac, such as is used by painters for canvas; the corners having wedges whereby the fabric can be stretched free from wrinkles, and when stretched the fabric is saturated with the size, which may be composed as follows:

Arrowroot	500 grains
Nelson's geletin	180 grains
Alum	110 grains
Water	120 ounces

or any other good size of comparatively hard quality. Great care should be taken that no creases are produced or allowed to remain in the fabric while drying. The fabric is allowed to dry upon the stretcher where it may remain until after the sensitizing operation. The sensitizing solution is the same as that used for paper, one giving considerable contrast being preferred. The sensitizing solutions ready for use can be obtained from The Platinotype Co.

The sensitizing solution is most conveniently applied by means of a flannel ball enclosing cotton wool, this being more suitable than the squeegee given in a former paper, as the fabric will sag on damping and the squeegee will not give an even coating. Care must be taken in the manipulations, as under too much pressure the surface of the fabric is easily abraded. When coated the fabric should be removed from the stretcher and be carefully dried, bearing in mind that the surface is easily scorched and spoilt. The removal of the fabric is necessary, as any solution between it and the wood would decompose and cause stains and marks. Printing is done in the usual way, frames having plate-glass fronts and screw pressure are recommended. A heavy equal pressure is desirable to prevent wrinkles forming or the image blurring through insufficient contact between the fabric and negative. For the same reason plenty of dry backing should be used, not omitting the usual piece of vulcanized rubber. Judging of the printing is rather more difficult than with paper. owing to the greater transparency of the support. This will be slightly improved if the rubber padding is white, but a little experience will soon teach the proper depth to which the print should be carried, or it may be determined by the use of an actinometer.

The development is the same as for paper, the fabric being either wholly immersed in the solution or run backwards and forwards under a glass rod under the solution. The latter method is of use when the fabric is much larger than the developing dish, but is not recommended on account of the difficulty of preventing streaks and bubbles. The prints are then transferred to an acid bath, this being repeated three times, after which the acid is removed by well rinsing in water, complete removal being of extreme importance. In the case of wood naturally only the lighter varieties are used, and the pieces must be well seasoned and perfectly smooth and flat. The size is applied by means of a soft brush or a ball of flannel, and the wood is dried under moderate pressure to prevent warping. The sensitizing solution is applied by means of a squeegee covered with sateen, and the wood carefully dried. The printing will have to be judged by means of an actinometer, as the nature of the support prevents the surface from being examined; the pressure should be considerable to produce absolute contact. The develpment should take place as soon as possible, and with a comparatively cool solution; the acid baths and washing as usual. The wood should be dried under pressure, and may be varnished or colored according to the fancy of the operator.

REDUCTION OF PLATINUM RESIDUES.

A few words on the reduction of platinum residues may not be entirely out of place. The richest source of platinum is the old developer, the water used for washing the measures, the squeegee, etc., used in sensitizing, and the paper cuttings. The acid baths contain very little platinum, only that carried over upon the surface of the prints, and which is too small a quantity to pay for its reduction.

From the developer—

To this add a saturated solution of ferrous sulphate, and boil for about fifteen minutes; filter this and heat the black precipitate left in the filter to a moderate degree with pure hydrochloric acid, to free it from any iron that may be present, well wash and convert into chloroplatinic acid by treatment with aqua regia, and thence to potassium chloroplatinite in the usual way.

The linen of the squeegee, the cuttings from the undeveloped prints, and the trimmings of developed prints, are all burned in a crucible, and the ashes mixed with three parts concentrated hydrochloric acid and one part concentrated nitric acid; the whole mixture is then gently heated for some hours at a temperature of 50 deg.—70 deg. C., it is then diluted with water, and the insoluble remainder well washed. From the liquid which runs through the filter in the above case, and also the wash water, platinum may be precipitated as ammonium chloroplatinite by adding strong liquid ammonia (·880).

On heating this precipitate to redness in a porcelain crucible, it is converted into metallic platinum, which can be reconverted into potassium chloroplatinite.

Platinum Toning.

This method of toning gelatino-chloride and albumenized silver prints has some advantages over gold toning, and is also capable of giving very fine results when the operations are carefully performed. The printing is carried out in the same manner as for gold toning, viz., the depth to which the print should be carried should be slightly greater than that required for the finished print, but not so far as to block out detail in the shadows. The prints must be kept as dry as possible, and all contact of the surface with the fingers avoided, else stains may be expected. The prints may be washed in changes of water until no opalescence is visible in the last, it is then advisable to pass them through a weak solution of common salt for a few minutes, to remove any free silver remaining. The following toning bath is due to Mr. Kidson Taylor.

Chloroplatinite of potassium	5 grains
Sodium chloride (common salt)	50 grains
Citric acid	50 grains
Distilled (or boiled) water	30 ounces

The bath will keep very well, and to renew its activity one grain of the platinum salt per twenty cabinet prints is required. The following bath is recommended by Lyonal Clarke, and is more rapid than the above stock solution.

Chloro-platinite of potash	60 grains
Distilled water	2 ounces

This will keep indefinitely.—*The Photogram.*

SKY AND LANDSCAPE ON ONE PLATE—A NOTE FOR YOUNG WORKERS.

BY W. THOMAS.

Under many circumstances it becomes not only possible, but quite a simple proceeding, to obtain a landscape with sky on the same plate, giving to each just that exposure needed to ensure the whole developing up without signs of under-exposure in the foreground or too ample exposure in the sky.

One result of working in this manner is to prevent ghastly examples being produced, with at least two distinct sources of light strongly *en evidence*, another being the excellent practice it offers for attaining some skill in manipulation while in field and when developing afterwards.

Walking along a weed and grass-grown strip of land skirting the River Blackwater, some time back, I thought to renew an oft-made experiment of attempting to render by one exposure a blue sky with masses of gray clouds floating across a hedgerow of dark green, and some rough foreground of grass and weed, with just a small pool of water reflecting the blue from above. On sitting down for reflection, over a pipe, it seemed, with the plate available and using a yellow screen, that six seconds' exposure for the landscape would be about ample, while the sky would call for not more than half a second. This being settled, and the camera rapidly put in position, slide drawn, and so on, the exposure was made by drawing slowly the blind shutter open until the landscape portion was exposed fully to the light's action, then giving the rest a flash. This roughly represented about three seconds to the foreground, and, say, a quarter of a second to the sky. Taking the opposite string, the same slow pull was given, and finishing again rapidly when the sky line was reached, which concluded the graduated exposure decided upon. For this kind of work, or, indeed, any, in the open, a simple blind shutter, such as sold by Place or Tyler, will be found quite as handy to use as a cap when giving lengthy exposures, or perfectly effective when fairly rapid work has to be done, always assuming the camera is fixed on its tripod.

The plate used on the occasion referred to above was a medium speed isochromatic, and No. 1 pale yellow screen behind the lens working at *f*/16.

On making a start to develop, a weak solution at first had to be employed until all the detail had satisfactorily been brought out, for the reason that much density in the small pool of water in the near foreground was undesirable, as also in the lighter portions of the sky. When the whole had developed out, a little more pyro being added, and a further trace of bromide, brought this negative quickly to printing density, the result being highly satisfactory, as to the rendering of gradation throughout, the print when made showing blue sky as gray, the clouds with full modeling, while the landscape portion came soft without dark patches of unbroken shadow, and finally the pool of water, instead of being shown as a patch of white, is toned to a light gray. Looking at the original negative, and a platinotype print from it before me now, shows these matters in marked manner, but whether the reproduction accompanying this note will equally render them I am unable to foresee; but the experiment is easy for you to try yourself, while the command such practice will give to you over the tools necessary to employ in photographic work will more than repay repeated attempts being made at truthful rendering of the many tones found in every landscape.—*The Amateur Photographer* (English).

Metal Vases and Articles with a Highly Polished Surface are as a rule difficult to photograph on account of the reflections, which give very hard dense patches in the negative. This can be avoided in several ways. A piece of soft well-kneaded putty dabbed or rolled over the surface will give a soft matt appearance, which photographs well. The putty will rub off easily and in no way damage the most delicate surface. Another plan is to place a screen of tissue paper or ground glass between the light and the object, this answers well in many cases and is less trouble than the foregoing. Again, a piece of ice placed inside a small cup or vase will cause the vapor in the air to condense on the surface and make it dull and thus a satisfactory photogram can be obtained.—*Photogram.*

Rapid Filtration.—A piece of chamois leather forms one of the quickest filters for straining syrupy solutions that would refuse to pass though ordinary filter paper. The leather should be well washed in a weak solution of soda, to free it from grease, and then rinsed thoroughly in clean, cold water. A pint of the thickest syrup will run through a wash-leather filter in less than five minutes. It should be well washed after use, and will then last almost indefinitely.

NOTES.

The Photographers' Association of Pennsylvania will hold their second annual convention at Bellefonte, Pa., on February 23, 24, and 25, 1898.

The French Societe d'Encouragement pour l'Industrie Nationale has awarded the Giffard prize of one thousand francs to M. Ducos du Hauron for his work in three-color photography.

Through An Oversight, we gave credit to *Cycle and Camera*, published in England, which was due to our American contemporary *The Photo-American.* It was originally written for, and published by the latter publication, but had been reprinted in the former.

Invention, Originality, Mannerism.—Leslie very properly points out that invention is not the same thing (in art) as creation, but is rather combination. Creation in its ordinary sense is only possible to a *very* limited degree in pictorial art. It very readily tends to run into either the false or the monstrous, *i.e.*, depicting of monsters, grotesque or repulsive. Another great danger of attempting creation is the production of a manner'd art.

"The Photographic Instructor," for the Professional and Amateur. By W. I. Lincoln Adams and Charles Ehrmann. Sixth Edition—Eighth Thousand. New York: The Scovill & Adams Company of New York.

Still another edition (the sixth) has been demanded of this popular instruction book, which brings the total sales up to eight thousand. This fact speaks louder for the practical value of the work than anything we might say.

The present edition is in paper covers, at the popular price of $1.00, so that it will be within the reach of all.

A Feature of "R. M. & W." Printing Out Papers that artists generally can appreciate is the absence of arbitrary conditions regarding the kind of negative to be used. Special negatives are not required. The artist simply makes the best negative he can, prints slightly deeper than for a gold tone, and tones in the gold bath only long enough to develop the high lights clearly. The result of this manipulation is that roundness, brilliancy, depth and softness so much desired by the up-to-date photographer and so pleasing to his patrons. Further "R. M. & W." papers do not bleach in the toning bath, and the same negative can be used for both glace and matt surface. In the production of their Victor and Vera, the Reichenbach, Morey & Will Co., seem to have fully considered every requirement and to have produced a satisfactory reply to every question suggested by the most advanced photographic practice in relation to printing out papers.

The G. Cramer Dry Plate Works are sending out the following letter:

"St. Louis, Sept. 1, 1897.

"We feel that an explanation is due our many friends, who have suffered inconvenience on account of our failure to fill their orders with the customary promptness.

"There has been a phenomenal increase in the orders for Cramer plates during the last three months, so that at the present time the demand far exceeds the supply, and we are way behind in filling our orders.

"However, we are at the present time busily engaged in enlarging our capacity, and are pushing matters to completion with all possible dispatch. When the improvements which we are making have been completed, we hope to be in a position to fill all orders regularly.

"Thanking you for your valued patronage and craving your indulgence for a short time longer, we remain,

"Yours Fraternally,
"G. Cramer Dry Plate Works."

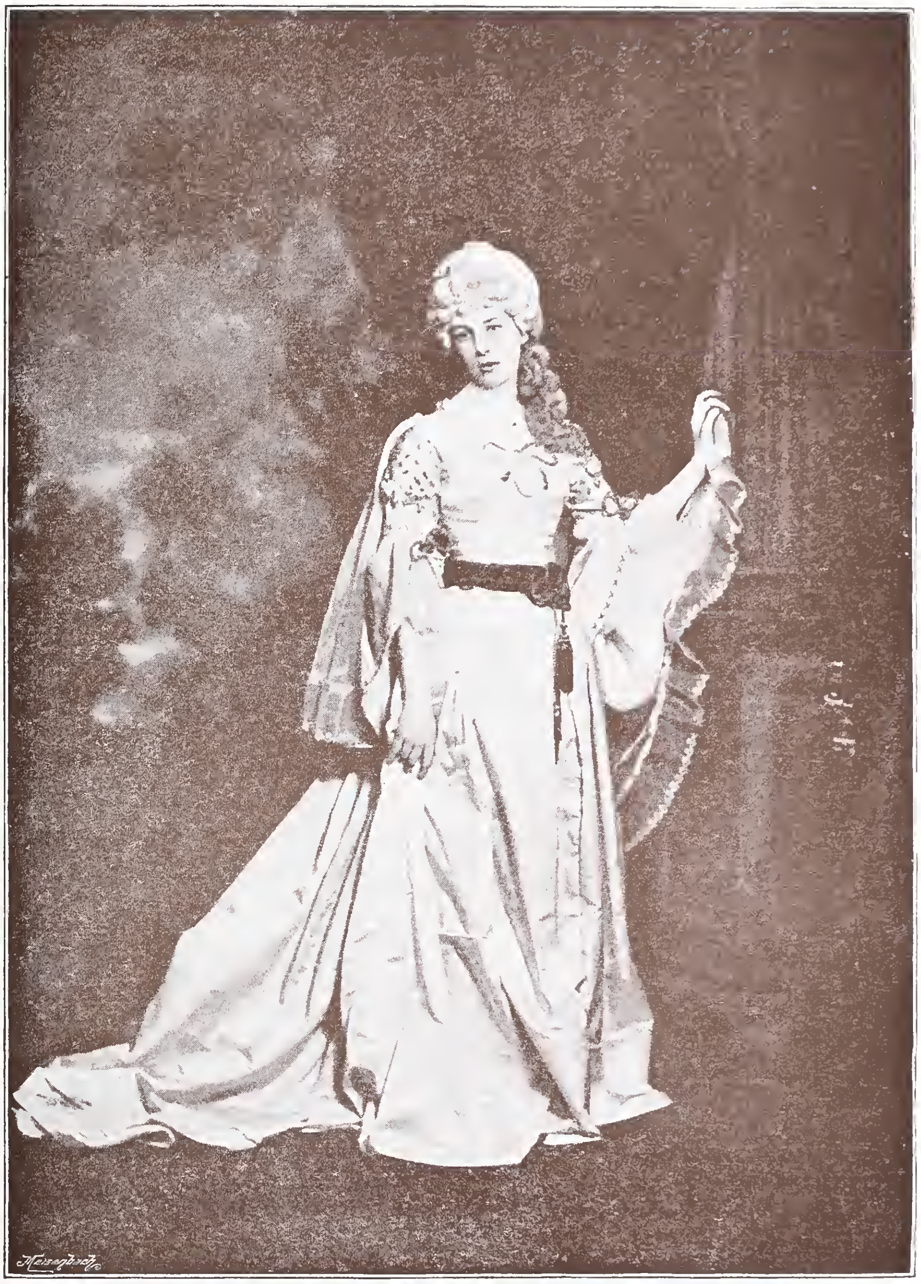
Platinotype Print—To Clean.—Most photographers have observed the curious predilection that photographic prints (of all kinds generally, and those on rough paper especially) have for gathering dirt. The following hint of how to clean a rough-surface print may prove useful. Make of flour and cold water a fairly thick paste of about the consistence of cream. To this add a small quantity of common alum, say half a teaspoonful of alum to a breakfast cupful of flour. With a spoon and pudding basin rub all together into as smooth a paste as possible. Now with a soft brush apply this paste all over the print and wash off again under the tap, when it will be found that the paste has gathered up the dust and dirt out of the grain of the paper, and the print comes out as fresh as the day it was made.

N. B.—Use plenty of paste on a very soft brush, or you may slightly abrade the more delicate tones of the print.—*A. P. Note Book.*

Relief, Breadth, Repose.—These three desirable qualities in a work of art are very largely due to the chiaroscuro or arrangement of light and shade.

Relief is due to the *contrast of light and shade*, for you cannot get two equal shades to stand out or separate one from the other; one to relieve the other. Relief is more needed in a large than in a small work, and especially if it be intended to be viewed from some distance.

Breadth is due to extending more or less even lights and shades, *i.e.*, large patches devoid of great contrast,



From "Photograms of the Year."

JADIS.

By ALFRED WERNER.

but not flat or devoid of gradation. Breadth is quite *necessary to give unity* to the whole work, and is the invisible chain linking the several parts together.

Repose is to a large extent *a matter of simplicity of design*, and is the result of so arranging matters that there are few striking or attractive outlines, the outlines for the most part merging into and being absorbed by the adjacent shades and shadows.—*A. P. Note Book.*

Robert E. Dietz.—We regret very much to learn of the death of Robert Edwin Dietz, who died at Hempstead, L. I., recently. He was born in 1818 in this city, on the corner of Spring and Crosby Streets, in a house built there by his grandfather, who came to this country during the revolution, and who kept a tannery on the corner of Wooster and Spring Streets. He was also the first manufacturer of glue in this city, his works being located in Magazine Street, which is now that part of Pearl Street between Broadway and Chatham Street.

The present R. E. Dietz Company, of which R. E. Dietz was founder and former president, occupied, until its recent destruction by fire, a large building, erected by him on Greenwich and Laight Streets, with branch houses at Chicago, Ill., and at London, England.—*From the New York Evening Mail and Express, Sept. 20th, 1897.*

At the recent P. A. of A. Convention, the matter of recognizing the valuable services of old Mr. Jex Bardwell, years ago, in supplying the evidence necessary to defeat the bromide patents, was brought up, a collection was taken and a subscription started for amounts from $1.00 to $10.00 to secure him and his invalid wife a home in some institution for the remainder of their lives.

As is generally known, Mr. Bardwell gave the desired evidence in his possession without charge, at considerable cost of money and time to himself, thereby saving to the photographic fraternity and their descendants, thousands of dollars. For those who have not yet subscribed, the opportunity is now presented of contributing towards the discharge of an obligation beyond computation as a matter of justice to one who is entitled to more than he can ever hope to realize.

G. Cramer, Orville C. Allen, George Steckel, J. Edward Rosch, Edward L. Wilson, C. M. Hayes, J. F. Ryder, Wm. H. Allen, Committee.

You are requested to help in this noble cause by sending any amount you desire to give, to William H. Allen, Treasurer, 247 Jefferson Ave., Detroit, Mich.

A Special Meeting of the Officers of the Michigan Photographers' Association was called at Detroit, on Wednesday, September 28, 1897. The officers present were: J. E. Watson, President; A. J. McMichael, First Vice-President; W. L. Smith, Treasurer, and E. S. Tray, Secretary. Ex-President Hayes of the National Association was also present The meeting was called to order by President Watson and the following list of prizes was decided upon:

Prize List: To Photographers outside of Michigan, Special Prize, Class "A"; for best portrait, one picture, $20 in gold, 1st prize. Silver medal, 2d prize. Genre Class—Class "B"; one picture, $20 in gold, 1st prize Silver medal, 2d prize.

Prizes for Michigan only: Grand Prize, Class "A"; four pictures, ten inches and larger, one gold medal, 1st prize; one silver medal, 2d prize; and one bronze medal, 3d prize.

Class "B"; 12 pictures up to ten inches, one gold medal, 1st prize; one silver medal, 2d prize; one bronze medal, 3d prize.

Class "C"; 12 pictures. No restrictions as to size from towns of 3000 and under; 1st prize, silver medal; 2d prize, bronze medal.

Class "D"; Landscape. Six pictures, any size, one silver medal.

Class "E"; Marine Views. Six pictures, any size, one silver medal.

Class "F"; Interior. Six pictures, any size, one silver medal.

Class "G"; Commercial Work. Six pictures, any size, one silver medal.

Scientific Photography—Open to all. One picture, one silver medal.

X-Ray Photography. One picture; one silver medal.

Microscopic Photography. One picture, one silver medal.

Genre Class. Two pictures, any size, 1st prize, one silver medal; 2d prize, one bronze medal.

Special Prize; Amateur Photography. Three pictures, no portrait, 1st prize, gold medal; 2d prize, silver medal; 3d prize, bronze medal; 4th prize, diploma.

Entry fee. $1. A. G. McMichael, 1st Vice-President, Detroit, Mich., will have charge of special prizes for photographers outside of Michigan. All correspondence concerning these prizes should be addressed to him. W. L. Smith, of Saginaw, will have charge of the special prizes for amateur photographers.

The Third Annual Convention of the Michigan Photographers' Association will be held at Jackson, February, 1898.

A Salon and Exhibition will be held by the Detroit Camera Club at the Detroit Museum of Art, Detroit, Michigan, on November 18, 19 and 20 next. For full particulars and entry forms address Mr. O'Brien Atkinson, Secretary, 17 Rowland Street, Detroit, Mich.

Mr. W. E. A. Drinkwater, in the *Photographic News*, gives a paper on the subject of "Lantern Slides by the Carbon Process." After an exhaustive description of his methods for producing lantern slides, he condenses the salient points in carbon printing as follows:

"All sensitized tissue must be kept flat under a weight to exclude both light and air.

"New tissue gives stronger contrasts than old.

"Old tissue prints much quicker than new.

"Tissue sensitized on a weak bath is much slower in printing than that sensitized on a strong bath.

"The action of light, once started, continues in the dark, therefore never expose the tissue to daylight at all (however weak), lamp or candle light only.

"A warm, damp atmosphere is very conducive to insolubility setting in, and in such weather the tissue rapidly becomes quicker-printing with a tendency to flat results and evil."

"A warm, damp atmosphere also helps on the continuating action of light when once started, and in such weather development should very speedily follow printing.

"Small quantities of ammonia in the final washing of hot water tend to brighten up the picture; and, to some extent, remedy the evils arising from over exposure or stale tissue.

"Ammonia used to excess has a strong solvent action on the gelatine, and will quickly destroy the delicacy of the lights and half-tones.

"Bear these maxims in mind, and their bearing on each other, and your lantern slides in carbon will be a success.

Stereoscopic Opera Glasses.—Messrs. Zeiss, of Jena glass fame, have, according to the *British Journal of Photography*, devised an opera glass of novel construction. It was recently pointed out in these columns that beyond a certain distance from a twin-lens camera, stereoscopic effect was not produced, and the same principal governs the action of the eye. Except by reason of practised judgment in comparing objects of known size, and to knowing distance or relief intuitively, the eye is incapable of itself of distinguishing between different planes beyond a given point. As a matter of course, there is no limit to the distance at which stereoscopic effect can be produced if the lenses are separated to a greater distance. This effect Messrs. Zeiss have taken advantage of in their new instrument. The object-lenses of the tubes of the opera glass are placed at the side instead of, as usual, at the ends of the instrument, which is made to open out into one straight line and so throw the lenses some distances from one another, and by means of an ingenious arrangement of prisms the rays passing through the objectives are bent back so as to arrive at eyepieces fixed the usual distance apart. By this means it is quite easy to see the view over a wall much higher than the spectator, or for him to hide behind a tree and project his lenses on each side of the trunk and enjoy the view beyond as though he observed it in the accustomed manner. The great advantage, however, that the new arrangement possesses is that, when the lenses are well separated, distant objects are seen with true roundness, and planes of varying distances are appreciated. For military purposes the new form will be valuable in enabling distances for training artillery to be better appreciated, as also the actual depths from back to front of bodies of troops at a distance. There can be little doubt that the idea of the new instrument has been suggested by the method of old stereoscopic workers of removing the camera between the two exposures to points some distance apart when distant objects were being photographed for stereoscopic views.

"**Sunlight and Shadow**." A Book for Photographers, Amateur and Professional. Edited by W. L, Lincoln Adams. Illustrated. New York, The Baker & Taylor Company.

In his little handbook entitled "Amateur Photography," which has had such a phenomenal sale (being now in its fourth edition and 5000th). Mr. Adams gives his readers practical guidance in the very first steps of photography. The present handsome volume is designed to help the more advanced photographer in his endeavor to produce artistic results both in the studio and out of doors. He assumes that the purely technical matters of exposure, development, printing, etc., have been substantially mastered, and that it is now the desire of the worker to improve himself (or herself) in the artistic side of photography, though the author does not omit the practical instruction necessary to accomplish the highest pictorial effects.

Mr. Adams has added to various articles and illustrations of his own, carefully selected papers and pictures by the leading photographic writers and workers, both of England and America. These have all been arranged in systematic order and formed into a complete book, which entirely covers the various departments of pictorial photography. There are fourteen chapters in all, on the following subjects :

CHAPTER I.—The Choice of Subject ; II.—Landscape without Figures ; III.—Landscape with Figures ; IV.—Foreground ; V.—The Sky ; VI.—Out-door Portraits and Groups ; VII.—The Hand Camera ; VIII.—Instantaneous Photography ; IX.—Winter Photography ; X.—Marines ; XI.—Photography at Night ; XII.—Lighting in Portraiture ; XIII.—Photographing Children ; XIV.—Art in Grouping : which gives an idea how completely and well the entire subject is covered by this useful book.

The illustrations are over one hundred in number, including initial letters, vignettes, tail pieces, etc., and are selected from the best work of the various photographic artists who were invited to contribute them, among whom we may mention such well-known names as H. P. Robinson, Alfred Stieglitz, J. Wells Champney, W. A. Fraser, Xanthus Smith, R. Eickemeyer, Jr., the Marquis de Alfarras, Her Grace the Duchess of Sermoneta, W. B. Post, B. J. Falk, and others equally prominent. Many are full page pictures, some being printed on only one side of the paper, while the initial letters, vignettes, etc., are scattered throughout the entire volume.

The book is printed on the heaviest wood-cut paper, which brings out the beautiful qualities of the photo-engravings to the very best advantage. It is printed from new type, large and clear, with liberal margins and spaces between, and is most handsomely and substantially bound in art canvas, with gilt design stamped on the cover, and with gilt edges. Altogether it makes the most handsome photographic book which we have ever seen, and will, undoubtedly, soon find its way to the waiting-room table of all prominent professional photographers, and into the libraries of the leading amateurs and clubs. The sale of advance copies, we are told, is already very large. It can be obtained from our publishers, or of any dealer in photographic materials, or book store. Price, $2.50, in a box. Post free, by mail.

How to Make a Brilliant View Meter and Finder.—Get an old bi-concave spectacle lens. One generally has one or two of these knocking about from old spectacles ; if not, an optician will provide you with one for a few pence. The focus of the lens does not matter. Then determine by looking through a small hole in a piece of card with the lens behind it, how far off the lens has to be from the card so as to take in the same view as your camera does, having first placed a small mask of black paper over the lens, having a rectangular hole cut in it, the sides of which bear the same ratio to one another as do the sides of the plate used. Then make a small box out of thin wood, just so wide and deep as the spectacle lens, and as long as the distance you have determined before. Fix the lens at one end of the box (being covered by the small mask), and at the opposite end cut a circular hole about half an inch in diameter. On looking through this hole the eye being close up against it, you ought to see a brilliant image on the lens of the exact view that your camera takes in. It will be a great help for you if you cover the circular hole *inside* with a piece of blue glass, which renders the view in monochrome, and so makes it much easier to judge of how the view will look in a photograph. If you work with several lenses you can easily arrange the spectacle lens so that its frame moves up and down the box, and you can have a piece of wire sticking up from it, and working in a slit in the top of the box with a scale beside it. With this arrangement you can tell how much a certain lens will take in, or what lens you will have to use to get a certain view; and by fixing it to your camera, so that you can take it off or put it on at will, you can use it as a finder, the image always being brilliant and well lit, even in the brightest sunshine.

This finder has many advantages over the usual ground-glass or the "brilliant" finders sold now with most hand cameras, which give different views according to the distance at which you view them. But with the one described this cannot happen, as the distance is fixed by the hole in the box for each lense you use. And also you can use it with a hand camera by holding the camera under your chin, which is the best position for it, both for steadiness and for the view it takes in, which is much truer than one taken from a yard or so from the ground, as is the position of the "look-down" finder.

If made tapering down to the circular hole the finder has a much neater appearance.—*Photographic News.*

Silhouette Photography.—Photographic silhouettes writes J. McConnell Sanders in *The Photographic News*, may readily be produced by means of an ordinary camera in the following manner. Let the sitter be placed close to a well-lighted window containing large panes of glass. The head should occupy, as near as possible, the center of the pane, and should be allowed to rest against the glass in such a manner that the profile can clearly be seen on the focusing screen of a camera placed at a convenient distant away. The following points should be observed :

1. No light should enter the room by other windows than the one under operation.

2. There should be no objects outside this window close enough to be "in focus."

3. The sitter's head should be focussed as sharply as possible, so as to present the appearance of a silhouetted profile on the screen.

The exposure should be made with a small stop (*e.g.*, *f* 22), and should be *short*—about half that requisite for producing the portrait of a sitter in the ordinary way, when well illuminated with the light under consideration.

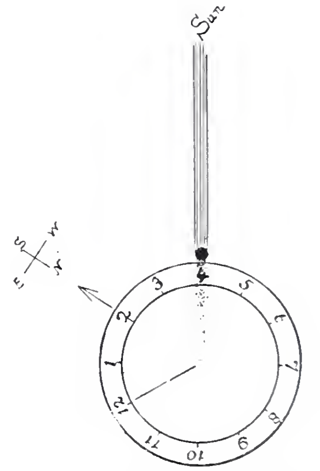
The plate is developed in the ordinary way, but development should be stopped before any details beyond the mere profile have made their appearance. If necessary, the negative can subsequently be intensified. Before printing from the negatives they should be "finished off" at the bust by means of a little dark-colored pigment, applied so as to produced the appearance shown in the illustrations.

Printing is best performed on matt surface P. O. P. subsequently toned, first with platinum chloride, then with the ordinary "combined bath."

Such silhouettes can be tastefully mounted in oval or circular minature frames, or can be cut to fit into lockets or watch cases.

A seasonable suggestion would be to mount them as Christmas cards, and if used in anticipation of a visit to a friend, they would correctly illustrate the appropriate motto :—"Coming events cast their *shadows* before."

Architecture, and Points of Compass.—*The proper title of this note should be, "How to tell the points of the Compass by means of a Watch when the sun is shining—a note for Architectural Photographers."* It is often a matter of very great importance to be able to determine the compass points of a building so that it may be visited at such an hour that the sun may be in a certain position. Thus compass points may easily be found if only the sun is shining, or even its position be known, *e.g.*, behind a cloud, if one has a watch which is going to time. Take any small object, say the point of a pencil, and hold it at the side of the watch opposite the hour at the time. Let it be four in the afternoon, for example, as shown in the accompanying figure. Now holding the watch more or less horizontal, turn about until the shadow of the pencil falls from the figure four to the center of the watch. Then half-way between the direction of the sun and the position of twelve on the watch is south. In this case it will be opposite two on the watch. The reason of this matter will be obvious when one remembers that the sun goes just half as fast as the hour hand, *i.e.*, the sun goes round the watch once in twenty-four hours, but the hour hand goes round every twelve hours. Suppose now it to be twelve noon, when the sun is due south. At that moment the figure twelve, the sun, and south point agree. In one hour the hour hand will have gone one-twelfth of the circle, while the sun has only gone one-twenty-fourth of its circle. If,



therefore, we point the figure one on the watch to where the sun now is, half the distance between that figure and twelve will be the south.

Or we can arrive at the same result in a slightly different way. For example, suppose the time to be now 5 o'clock. If we take just half this time from noon, *i.e.*, 2 30, and point 2.30 on the watch to the sun, then 12 o'clock will be opposite south. Similarly if the time be ten in the forenoon, there are yet two hours to noon. We must therefore point the one, *i.e.*, the figure eleven towards the sun, and the figure twelve will point south.

Focusing in Dark Interiors.—The difficulties of focusing in dark interiors are familiar to all who have attempted this class of work. The difficulties arise from various causes, and various expedients have been suggested, such as using a candle flame, sheet of large print, etc. But after having obtained a sharp focus with a fairly large stop, the difficulty arises about adjusting it when a stop sufficiently small to give the required deprh of focus has been inserted, for now little or nothing can be seen on the ground-glass.

The subjoined table (which was first worked out and published by Rev. F. C. Lambert) will be found of considerable assistance when once the method of its use has been grasped The following explanation, by means of an example or two, will easily make this clear.

TABLE TO ASSIST FOCUSING.

	5	10	20	50	100	500	INFINITY.
5	.	7½	8	9	10	10	10
10	.....	.	13	10	18	19	20
20	.....	.....	.	28	33	38	40
50	.....	.....	.....	.	66	91	95
100	.....	.....	.....	.....	.	166	185
500	.....	.....	.....	.....	.....	.	666

Suppose that the nearest object we wish to include in the picture is situated about 10 ft. away from the camera, and that the most distant object is, say, 50 ft. away. Now to get depth of focus sufficient for this case such a small stop will be required that probably very little or nothing will be seen on the ground-glass, and when the open aperture of the lens is used only a very limited area is in anything like sharp focus. But if only we knew what point to focus for with the open aperture of the lens so that when the small stop was inserted the depth of focus would cover the nearest and most distant points, then all would be easy. This is what the table aims to tell us Glancing along the left-hand column we see the figure 10. Now run the eye along the corresponding horizontal line of figures, until under 50 on the top line we see the number 16. This tells us that if we focus for an object 16 ft. away, and then insert a sufficiently small stop, we shall get the points 10 and 50 ft. equally sharp Thus we may take the left-hand vertical column for the distance of the nearest object, and the horizontal top line of figures for the most distant object. Then the figures at the point where these two columns meet give us the point to focus for, so that the two other points nearest and most distant may be equally sharp with a small stop. Another example: Suppose that the nearest object be 20 ft. away, and the most distant be 100 ft. away, we see that where the two horizontal and vertical columns meet we have 33 ft. as the point to focus for. Thus according to this table the old rule of "about one-third" does not hold good. Thus for two points, 10 and 20, we focus for 13 ft.; for 10 and 50, the focus point is 16; for 10 and 100, we aim at 18; for 10 and 500 at 19; and for 10 and infinity we aim at a point 20 ft. Thus the table becomes of service to the *hand-camera* man who wishes to use a small stop to include a certain depth of focus, and has no focusing screen. In that case he would simply adjust by the graduated scale for the focus point, and insert a sufficiently small stop.

[Note.—This table gives no hint as to what stop must be used—only the point to focus for without the stop.—*The Amateur Photographer* (England).

Developing Over-exposed Plates.—"Development a difficulty? my dear sir—not a bit. You just adopt my formula, work it as I work it, and it is as easy as A B C. Over-exposure matter? Not a bit. Under-exposure? Not a bit. You just adopt my system, and you are as right as the Bank. Look here, old man, on your way home, you just call at Deppow's, and get the things, and make some exposures. Deppow will show you how to do that. I'll develop you the first dozen, and you'll be delighted. I'll call round to-night." It was Faiks who was speaking, and luring his friend in the direction of photography. You see, Faiks was a prominent member of the local society, had won a medal or two, and having invented a new developer, never tired of pressing it upon any unfortunate listener he could secure. Faiks's friend listened, and fell—that is to say, he called at Deppow's, bought a complete outfit, had the whole art and mystery of exposure explained, and had not left the shop many minutes before he was seized with a burning desire to have a shot at something, anything, no matter what. The desire grew stronger and stronger, and only with an effort, almost superhuman, was it repressed until he arrived at home—and then he was entirely overcome. In about as many minutes he had exposed four plates—carefully, and fully in accord with Deppow's instructions Then again, he was seized with the spirit of unrest; there was a feverish anxiety to know what he had got, and his thoughts reverted to Faiks and his generous offer, and his wonderful developer, and beautiful system. And, as luck would have it, Faiks called in, and took away the slides, remarking: "All right, old man; I shall be delighted to develop them; you know with my system I always get a perfect negative, always." Faiks returned home, had his supper, repaired to the dark-room, compounded his wonderful developer, and started on his variation of "tentative" development. And darkness came over the scene, and came so quickly and so effectually that Faiks could not see his lamp through the plate. "Hem, over-exposed awfully," he softly mused to himself, his confidence little abated. "I'll try soaking in bromide,', he murmured gently, but firmly. Plate number two was brought face to face with expected salvation in a bromide bath, and was rocked gently and patiently for half an hour. The feet of Faiks grew cold, and his wife (good woman as she was), from the head of the stairs, instituted kind enquiries as to probable time of retirement, and he said: "Never mind," and said it in a tone impossible to convey in mere type, or even through the medium of an illustration. He poured off the bromide, applied the developer to the plate; the latter hesitated and turned pale, pale grey, just at first, then it gained confidence, and density, and the grey deepened into darkness, and into a blackness that might have been felt, and there was no sign of a picture. Faiks was not very excitable, but he was very vain His vaunted developer, his system, and his promises to his friend, all passed through his mind. His reputation was at stake. He possessed that quality which in man is usually called determination, in women obstinacy. He knew no such word as "fail," as they say of heroes. He stole stealthily—good word—to the scullery, annexed the roller towel, wet it under the tap, and applied it gently but firmly to his throbbing brow, lighted his pipe, drew at it viciously, and commenced to wade through the almanacs. Already he had spoiled two plates, two out of four. "The very thing," he exclaimed, as he found "Citrates as restrainers," and read the article; and first he thanked Mr. Webster mentally read the article again, and thanked Mr. Webster aloud, gratitude welled in his bosom, and his reputation—sometimes vulgarly known as "bacon"—might yet be saved. Even two negatives out of four plates, and his friend would be happy. Happy friend—happy, happy Faiks. But alas! the third was no better than the others: it might have been a beautiful negative if the exposure had been made upon a sheet of mourning notepaper. An utterly dense center, with a beautiful clear margin, showed where the delicate constitution of the bromide of silver had been protected by the rebate of the dark slide.

Faiks resolved not to deal with the fourth plate. His friend could get that developed elsewhere, anywhere, where the Dickens he liked. He went to bed, but not to sleep; all night long he tossed and wondered—could it be his fault? If so, where? His light was safe, his dishes were clean, and so were his measures. His developer was right, and his light was safe, for had he not clean rebates. Poor, restless Faiks. He called next day upon his friend, and went into a long explanation. He restrained his developer, he used bromide, he used citrate, and he had never never such a thing occur before, was awfully sorry, you know, really can't understand it, old man." Seeing his deep agitation, his friend begged Faiks to be seated. His friend also took a seat, crossed his legs, rolled a cigarette, and lighted it, and at the same time saying between the operations. "Well really, old boy, don't worry yourself so, don't worry, yourself. I really didn't expect a lot, because, you see, after I made the exposure in the garden, I naturally felt curious, and I just had a look at the plates. And I really couldn't see anything on them myself, so don't worry, old man."

Faiks eyed his friend steadily, but said never a word; language failed him.—*Photography*.

Luminous Phenomena Observed on Mountains.—Mr. C. G. Cash writes to *Nature*: On Easter Monday, 19th ult., I was ascending Braeriach by its well-known northern ridge, and, shortly after I had crossed the "snow line," I witnessed a phenomenon of great beauty, the explanation of which I cannot give: The edge of my plaid, of my gloved hands, of my knickerbockers, etc, was bordered by a two inch band of brilliant violet light, at the moment of beginning any movement The light was not visible around anything at rest, nor did it persist, but only showed at the moment when rest was exchanged for movement. My attention was directed to this for a very short time only, for heavy snow began to drive in my face, and I had to watch where I was going, as the immediate surroundings included dangerous ground. After my return, I found an account of a somewhat similar appearance in the *Cairngorm Club Journal*, vol i. p. 159. I copy the account as there given by Dr. John Gordon, of Aberdeen: "Half way across the snow slope, while the sun was somewhat obscured, but was still sending a considerable intensity of light, we observed a strange phenomenon. On the side of our body next the snow slope, there was a nimbus of violet light, which clung to clothes, naked fingers, and the shaft of the ice axe. So plentiful did it appear in the palm of the hand that it looked at times like a pool of violet ink, and one thought it could be pitched away. On shaking the hand, however, the nimbus clung, and was not to be removed. Occasionally the color varied, taking on shades of brownish-yellow, and blue, but violet was the most marked color. At another time, in much the same condition of light and snow surroundings, one of the party, who was very proud of the beauty of the silver case of his compass, was disgusted to find that it had a distinctly yellow, pinchbeck look. This light refraction or polarization [?] was not so evident to some of the party, but the writer has observed it before in similar circumstances and atmospheric conditions." I may add that in my own case, no direct sunlight reached me, as I was in the lower part of a dense cloud of mist. Some of your readers may offer an explanation or this remarkable and beautiful appearance

---

The Grain of Dry Plates.—R. E. Liesegang, in the current number of the *Photograpisches Archiv*, states that he investigated the question of the grain of dry plates shortly after Schumann, Ostwald, and Gaedicke, who by chance referred to the size of the grain in negatives, and the relation to the sensitiveness of the plates.

Schumann, who has now been obliged by his physician to discontinue all work, determined that the grain of the negative need not correspond to the grain of the original silver bromide grain. This was of special interest, because in his spectroscopic work he required extremely fine-grained negatives in order to enable accurate movement of the lines to be done. He exposed a plate cut into three parts and developed the first in a normal pyro developer. For the second a small quantity of bromide of potassium was added to the developer, whilst for the third part a considerable quantity of bromide was used.

The well-known action of the bromide was at once manifest, as the third section was much more full of contrast than the first. At the same time a hitherto unknown action of the bromide was seen, which perhaps helps only secondarily the increase of the contrast. The first section was so fine-grained that the grain could only be detected with a microscope. The third section was so coarse-grained that the particles of silver were actually separated by spaces of clear glass, and had the appearance of the grain of a half-tone block. The second section had a medium grain.

The original grain can be enlarged by the addition of potassium bromide, and Schuman believed it correct to assume that some of the silver bromide dissolved in the potassium bromide, and that the developer reduced the dissolved salt and that the nascent silver was precipitated as in physical development on the silver grains of which the image is composed.

It may also happen that the enlargement of the grain may be caused by the prolongation of the development by the bromide. for Liesegang states that he has already pointed out that in prolonged development with an alkaline developer the grain may increase just as the grain in a finished negative may increase by heating it. It should also be noted that Schumann used an emulsion very poor in gelatine, and, therefore, any action would be more pronounced than in an ordinary dry plate.

Later on, Gaedicke pointed out the possibility of another function of the bromide, for in the film of emulsion there are not silver bromide grains all of one size, but of very different sizes. The potassium bromide would then only destroy the action of light on the smallest grains, whilst the larger particles would be less attacked, and, therefore, be blackened by the developer. This would explain, moreover, the increase of the contrasts. To explain Schumann's phenomenon, another hypothesis was necessary.

Ostwald does not believe that the increase of light, sensitiveness of an emulsion need be dependent on the increase of the size of the grain. All compounds exhibit a tendency to enter into a more stable form, so that thelight-sensitiveness should thus actually decrease after the ripening. Ostwald, therefore, believed that the silver bromide gradually entered into combination with the gelatine.

Schumann has shown a very beautiful experiment, which proves the sensitizing action of gelatine. He coated half a glass plate with solution of gelatine, whilst the other half was left blank. He then placed it in a water bath in which finely divided silver bromide was suspended, and which settled regularly over the whole plate. Both parts of the plate were simultaneously exposed and developed, and the gelatinized half gave a normal, vigorous negative, whilst the half free from gelatine gave scarcely the trace of an image.—*British Journal of Photography*.

Iodated Salt—A Rapid Hypo Eliminator.—In the the current number of the *Bulletin de la Société Francaise de Photographie* appears a paper by M. P. Mercier upon a new salt which he has introduced for the rapid elimination of hypo, and which quickly eliminates the hypo without in any way affecting even the most delicate silver image. It possesses the property of destroying the insoluble variety of silver hyposulphite $AgS_2O_3Na-S_2O_3$, which is formed by incomplete fixation, and which cannot be eliminated by copious washing.

Most of the eliminators which have been proposed have not been much used in practice, because some of them stain the proofs, as in the case of permanganate, or else they attack the image, like chlorine and the hypochlorites, or else they do not act sufficiently, as in the case of some of the persalts recently introduced.

The iodated salt is satisfactory from every point of view, as it permits of the total elimination of the hypo in the case of proofs insufficiently fixed, and this may be proved by touching the whites of the prints with a brush dipped in a ten per cent. solution of silver nitrate: there will be no yellow stain, proving the absence of hyposulphite.

The salt can be prepared by simply treating iodine with an alkali or alkaline salt, so that a colorless salt is obtained. With the alkaline carbonates or phosphates the decoloration is very slow, but it is immediate if ammonia is added little by little. Iodide of nitrogen is formed if ammonia be used, but this may be prevented by adding also a chloride as suggested below. Borates and sulphites may also be used instead of the carbonates or phosphates. In every case the iodine ought to be almost colorless before it is used, and in this condition it will eliminate the hypo without attacking the image at all.

All that has been said with regard to iodine applies also to bromine, but the bromated alkalies eliminate the sulphites less rapidly than the iodates, and they must be absolutely colorless, for with the slightest tinge of yellowness a solution will attack the image very vigorously.

It is difficult to state exactly what are the various compounds in solutions of iodine and bromine thus formed. According to the researches of Schoenbein, Lenssen, and Lewenthal, they contain the hypo-iodides, iodides, and iodates, but the two latter separately have no action on the hyposulphites. There are probably formed intermediate compounds which have no action on the silver image, but act particularly on the hyposulphites.

The preparation of the iodated salt is tedious, disagreeable, and certainly more costly than to purchase it ready prepared. For those who wish to prepare it themselves the following method may be adopted: mix in a porcelain mortar

Iodine..........	3 parts
Salt......................	30 parts

The iodine should be well rubbed down with the salt as this facilitates solution. A small quantity of potassium iodide will help it to dissolve, but it gives a reddish solution which decolorizes very slowly. An alcoholic solution of iodine may be used, and this can be obtained from any chemist as tincture of iodine, and thirty-six parts will be required to equal the dry iodine. Then to the above mixture is added

Carbonate of soda.....	30 parts

and the whole well mixed together; it should then be dissolved in 1,000 parts of water, and it may be used after twenty-four hours. or, if wanted in a great hurry, it may be gently heated on a water bath or decolorized by adding ammonia drop by drop.

A solution containing two per cent. of the salt may be exposed for a very long time to the air without undergoing any change, and a quart of it is sufficient for about twenty 7x5 plates, and when of this strength it requires for the total elimination of the hypo at least half an hour for negatives and positives on glass, five minutes for salted paper, ten minutes for bromide paper, fifteen minutes for albumenized paper, and one hour for gelatino-chloride paper. The prints may be left for a long time in the bath, or the proportion of iodated salt may be increased without inconvenience; the image will not be attacked. The proportion of salt may be reduced for salted and bromide papers when the time of immersion is increased.

The negatives or prints should be rinsed for five minutes when taken from the fixing bath to remove the excess of hypo and then placed in eliminator and the dish rocked from time to time. It is advisable, when the bath has been used for some time, to use a second and new bath. The prints and plates should, after treatment, be rinsed for some minutes in water.

With imperfectly fixed prints an immersion of ten minutes in the iodate bath will eliminate more hypo than washing for ten hours in running water.—*The British Jouranl of Photography.*

"The American Annual of Photography and Photographic Times Almanac." New York. The Scoville and Adams Co.—Perhaps the best indication of the popularity of this annual visitor, is the fact that within a couple of weeks of the appearance of the 1897 volume, the first addition of 12,000 copies was almost exhausted, and the popularity is well deserved. It includes fifty original articles of more or less interest, led off by Mr. Alfred Stieglitz, on the hand camera, from which, no doubt, many will be surprised to learn that some of his well-known and wonderfully beautiful pictures, that have been admired and medalled all over the world, are enlargement from hand-camera negatives. Chapman Jones calls attention to an old method of single transfer carbon printing, that if taken up by an artistic photographer and properly wrought, could not fail to bring him both fame and fortune.

The articles are followed by some thirty pages of well-selected formulæ, in which it is hardly possible for the photographer to want anything that he cannot find; the usual tables, time-saving as "ready reckoners," and a lot of general information.

But it is the illustrations that the 1897 *Annual* is especially strong. Hitherto, we have had to find fault not only with most of the annuals, but with many of the journals also for selecting illustrations, that, while they should have been examples worthy of being wrought up to, were, many of them at least, specimens of what to avoid. Here, we have over one hundred and twenty, fifty-seven of which are full-page pictures, and there are only two that we should have been glad to see omitted, "Brighter Than My Jewels" and "A Flower of the East." They are striking examples of the evil of scattering lights all over the composition, and the utter absence of that concentration so essential in portraiture. But to find only two faulty pictures in one hundred and twenty-seven is as rare as it is satisfactory, and we congratulate the editor on having made such a record.

Among the fifty-seven full-page pictures, Mr. A. Moreno easily takes first place, but whether with "The Awakening" or "The Gleaner" it is difficult to say. Both are perfect pictures; and put the stamp of a true artist on their author. Perhaps, on the whole, the greater simplicity with equally good effect, leads us to prefer the latter as the better of the two. They are the work of the Photochrome Engraving Company of New York, and are of the very highest order of reproduction.

The *American Annual* for 1897 is a triumph of the printers' and engravers' art, creditable alike to editor and publishers; a useful book of reference on photog. technique, and an invaluable source of inspiration to the student of art.—*The American Amateur Photographer.*

Conrad Kindermann was born at Lübeck in the year 1842, and apprenticed at 13 years of age to a cloth house in Riza, Russia. After having completed his five years of service, he still remained in the employ of the firm for an other year. He had a brother in Hamburg, an artist and photographer whom he visited at that time and who persuaded him to embrace photography as a profession. He entered his brother's atelier, worked there for six months, engaged afterwards with a photographer in Lübeck, and in the year 1863 went to work on his own account in the same city. He rented a studio that had stood idle for several years because of the scanty facilities to do good work. Its roof was so extremely low that a full figure of an adult could not be taken. Kindermann devoted himself mainly to the photographing of children, and laid here the foundation to the great reputation he has always enjoyed in that particular branch. The efforts made resulted favorably, and after another six months we find K. to improve and enlarge his gallery.

One of Kindermann's maxims has always been to improve by the work of others, and for that reason he nas every year devoted a certain time to visit the foremost galleries of his fatherland and adjacent countries.

In 1869 Herr Banque, of Triest, came to Lübeck, visited K., and the two formed an intimate friendship, resulting in a parnership and an establishment in Hamburg. But business did not prove to be prosperous enough to support even one family, not to speak of two, and Banque retired from the partnership. Immediately after that business took a turn for the better; Kindermann made money enough to improve his establishment, and to surround himself with better facilities.

By that time his reputation as a photographer of young children was firmly established.

In 1881 he took a general agency for the Van Monkhoven gelatine emulsion plate, and was instrumental to introduce the dry plate in Germany more, perhaps, than any body else.

The photographic business on "Die grossen Bleichen" was carried on with more and more success, and when Kindermann finally found his locality to be insufficient to answer the demands of the public, he erected that palatial studio on the *Esplanade.*

The studios and laboratories there were perfect models, and every facility to do work was extant, but after a short time only, still more extensive enlargements were demanded, the rooms designed for domestic purposes soon merged with the working room, and a separate building was secured as a depot for the Monkhoven plates.

Kindermann is one of Germany's foremost artistic photographers, he is an amiable and polished gentleman, and knows how to make friends, and how to keep them. He has been intimately connected with the great *Deutsche Photographen Verein*, has been a member since 1881, and in the Board of Officers elected and re-elected every year since 1882.

His artistic efforts in photography have earned an excellent reputation.

PHOTOGRAPHIC PATENTS.

GRANTED DURING THE MONTH OF SEPTEMBER, 1897.

(Furnished for the Photographic Times by William S. Hodges, Patent Lawyer, Washington, D. C.)

579,304. **Photographic Camera.** S. Ritter, Copenhagen, Denmark.

A camera is made up of a box or case provided with a funnel adapted to be moved into and out of the same. Hinged pieces are arranged at the ends of the slot through which the funnel can be moved, said hinge pieces being provided with spring-clips, pins and guide-pieces.

589,346. **Magazine Camera.** E. E. Flora, Chicago, Illinois.

The casing of the camera is formed of telescoping sections, in one of which is pivotally secured a plate carrier or magazine. Mechanism is provided for raising the carrier or magazine to a vertical position by the inward movement of the sections, and to lower it to a horizontal position and release one of the plate holders by the extension of said sections.

589,349. **Photographic Camera.** L. J. R. Holst, Amsterdam, Netherlands.

This invention comprises a finding mirror behind the lens, composed of two parts, one of which is adapted to be elevated and the other depressed out of the path of the rays from the lens to the plate.

589,475. **Magazine Camera.** H. W. Locke, Rochester, N. Y., assignor to W. F. Carlton, same place.

The inventor claims a magazine camera having fixed side, bottom and top walls, a removable rear lid and a lower compartment. A door is adapted to slide through the rear into said lower compartment. A front upper compartment is provided and a rear upper plate or film holder chamber is arranged in line with said upper compartment but of lesser height and width, said chamber having a bottom plate separating it permanently from the lower compartment, a top plate extending forward a lesser distance than the bottom plate, and projecting studs at its front and sides. A sliding partition is arranged between said upper and lower compartments and slides rearwardly through the slot in said lid. Plate or film holders are provided having notched side flanges which are adapted to seat against said studs, the front plate or film holder alone being then located forward of the front edge of said top plate, and with its notches below the corresponding studs. Sliding bars are located on each side of the said upper compartment, having on their ends arms which project beneath the bottom edge of the front holder, said arms having upwardly projecting lips forward of the front edge of the front holder, spring arms being carried by said sliding bars and projecting rearwardly to the rear of said chamber. A vertically movable slide is connected to said spring-arms and slides up and down, means being provided for operating said slide, and accessible through an opening in said rear lid, so that when said slide is moved up the front plate or film holder alone is elevated until its notches register with the studs, whereupon said front holder is free to fall down by gravity. A follower is located in said chamber back of the plate or film holder therein, and a spring is interposed between the same and said slide for forcing said follower against said holders.

589,649. **Photometer.** J. L. Fuelling, Peoria, Ill.

This invention comprises a main plate having a mirror-carrying frame pivoted at one end and adapted to fold down thereon, a pupil gauge being pivoted to the other end of said main plate, and also adapted to fold down thereon.

589,843. **Photographer's Drying Rack.** W. H. Lewis, Huntington, N. Y.

A drying rack composed of two frames pivoted together is provided with an auxiliary frame pivoted to one member of the main frame, and adapted to be swung into two positions, one at right angles to the member to which it is pivoted, and the other in the same plane with it.

590,204. **Roll Holding Flash Light Camera.** J. E. Blackmore, Newark, N. J.

A camera is provided with a movable film and shutter for exposing the same, and also a chamber for containing a charge of flashlight powder. A hammer is provided for exploding the same and means connected therewith, and to said film for actuating both of them simultaneously. Means are also provided whereby the powder is exploded, and the shutter opened simultaneously.

590,632. **Photographic Print Washer.** F. Shurig, Huntingburg, Ind.

In a photographic print and negative washer, a wash vessel having an overflow connection at the top and provided with a dished conical bottom having a combined water supply and drain pipe connection at its apex. A downwardly dished false bottom is fitted within the vessel above the main bottom thereof, and provided with a multiplicity of jet openings whose sides are disposed at an angle to the vertical center of the vessel, the central one of said openings being larger than the others.

DESIGNS.

27,497. **Card Mount.** J. P. Odgers, Philadelphia, Pa., assignor to the A. M. Collins Manufacturing Co., same place. Term of patent, seven years.

27,498. **Card Mount.** D. D. Dunklee, Greenfield, Mass. Term of patent, seven years.

gradually added, and a white silver bromide emulsion is produced. The change is thus represented :

$$AgNO_3 + (NH_4)Br = AgBr + (NH_4)NO_3.$$

Now, it must be noted that silver bromide is sensitive to the action of light, so that the addition above described in making the emulsion must, of course, be performed in a non-actinic light.

When the bromide is added to the silver, a certain quantity will combine with it, and no more. A simple calculation tells us that according to the equation 119 parts by weight of potassium bromide will combine with 170 parts by weight of silver nitrate.[*]

The sensitiveness of the emulsion is increased by boiling it. This has the effect of converting the insensitive very fine reddish silver bromide into a very sensitive coarse blue substance.

We have shown that in mixing the bromide with the silver, silver bromide and ammonium nitrate are formed. The next process is to wash the latter soluble compound from the emulsion. This is done by breaking the gelatine emulsion up into small shreds and washing well in several changes of water ; besides the potassium or ammonium nitrate, any soluble bromide is also washed away, leaving the insoluble sensitive silver bromide in the gelatine. It is then remelted, and glass plates coated with it and dried are termed gelatine dry plates.

These dry plates are, when required, placed in the camera and exposed to the image formed by the lens. The effect of this is that a *latent* or invisible image is impressed on the film of the plate, which may be afterwards rendered visible by development. What is the change that occurs to produce this effect? Chemists and scientists are as yet divided upon the subject.

The theory that till recently has met with general acceptance, and which Captain Abney gives in his work, is that the silver bromide is reduced by light to sub-bromide (Ag_2Br). The formation of this sub-bromide depends, of course on the active rays from different parts of the object.

Another theory is that electricity is sufficient to account for the formation of the latent image.[†]

C. J. Leaper says [‡] that the weight of indirect evidence (necessarily indirect from the difficulties surrounding the problem to be solved) seems to point to the formation by light of silver oxybromide $Ag_2O.2AgBr$. It is well known that bromine is evolved during exposure,[§] and on the assumption that oxygen is at the same time absorbed, we may express the change by the following equation :—

$$4AgBr + O = Ag_2O.2AgBr + Br.$$

Carey Lea, in America, has recently published his investigations in what he terms the "photo-salts of silver," which he has prepared, and which he states are producible from the haloid salts of silver (the chloride, bromide and iodide) by the action of light, as well as by purely chemical means, his photo-bromide consisting of silver sub-bromide in combination with silver bromide, the sub-bromide forming but a small portion of the whole. This photo-bromide is insoluble in strong nitric acid, whilst the sub-bromide itself is very soluble in it, and this theory receives strong confirmation in other ways ; it appears to be the one most probably correct.[‖]

The latent image produced, we have next to consider the action of the developing agent. All developers are energetic oxygen absorbers, it being upon this property that their power of developing is based. The commonest developer is the pyrogallic acid.

Pyrogallic acid is an erroneous term for what is not an acid at all, but more correctly pyrogallol—its chemical name is tryhydroxy-benzene. It is a powerful and greedy absorber of oxygen. It is only active in an alkaline medium. Combined with ammonia, its action on the silver sub-bromide is to reduce the silver to the metallic state, ammonium bromide being formed thus—

$$\begin{gathered} C_6H_4(OH)_3 + 2Ag_2Br + 2(NH_4)OH \\ = 2NH_4Br + 2Ag_2 + H_2O + (C_6H_4OH_3 + O) \end{gathered}$$

When ammonium bromide is used with this developer as a restrainer, its action appears to consist in diminishing the amount of silver sub-bromide capable of being dissolved by the ammonia. If strong ammonia is used more silver bromide is dissolved. If strong pyro solution is used a more rapid reduction of the bromide will take place, resulting eventually in fog.

Another developer largely employed is the ferrous oxalate, composed of ferrous sulphate, mixed with potassic oxalate, forming ferrous oxalate and potassic sulphate, the ferrous oxalate being dissolved by the excess of potassic oxalate.

$$K_2C_2O_4 + FeSO_4 = FeC_2O_4 + K_2SO_4.$$

This also acts as a powerful reducing agent, becoming oxidized to ferric salt.

$$6FeC_2O_4 + 6Ag_2Br = 6Ag_2 + Fe_2Br_6 + 2Fe_2(C_2O_4)_3.$$

---

[*] In practice, however, a larger quantity of bromide is taken than the equation represents, because it prevents the silver nitrate from combining with the gelatine, and for other reasons.

[†] "The Chemistry of Photography," by J. C. Wiggin.

[‡] "The Chemistry of a Dry-plate."

[§] If dry plates are exposed to the light, a distinct smell of bromine can be detected.

[‖] J. C. Wiggin.

Hydroquinone or paradihydroxybenzene is another favorite developing agent. It is closely allied to pyro, its formula being $C_6H_4(OH)_2$. On development it becomes oxidized to quinone.

$$C_6H_4(OH)_2+O=C_6H_4O_2+H_2O.$$

Besides the various reducing agents used as developers, the alkalies—ammonia potash and soda and their carbonates—are used as accelerators. Ammonia is most energetic, but is liable to produce stains.

The latent image having been developed and become visible, the next operation is to fix the image, or, in other words, to make it permanent by dissolving out the silver bromide unacted upon by the light. If this were not done it will be obvious that the image would be reduced on exposure to the light. The fixing salt usually employed is sodium hyposulphite. Potassium cyanide, common salt, ammonia, and other salts can also be employed. Hyposulphite of soda, or, as it is more correctly termed, sodium thiosulphate, is considered to be sodium sulphate Na_2SO_4, in which one atom of oxygen has been replaced by sulphur.

$$Na_2S_2O_3.$$

The action of this salt upon the photographic film is one of double decomposition.

$$Na_2S_2O_3+2AgBr=2NaBr+Ag_2S_2O_3.$$

The silver hyposulphite formed combines with excess of hypo forming the soluble double salt.

$$Ag_2S_2O_3,\ 2Na_2SO_3.$$

If the hypo is not in excess another double salt is formed.

$$Ag_2S_2O_3,Na_2O_2.$$

This salt is almost insoluble, and is with difficulty eliminated from the film. The importance of having plenty of hypo in the bath will be at once obvious.

After fixing, the plate is thoroughly well washed to eliminate all soluble matter. A clearing bath of acid and alum is sometimes applied. Before this application, however, it is absolutely necessary that all the hyposulphite be thoroughly eliminated from the film, otherwise it will be decomposed, the following reaction taking place:

$$Na_2S_2O_3+2HCl=H_2O+SO_2+2NaCl.$$

If the negative image be too thin for the subsequent manipulation, it is intensified. This is accomplished either by increasing the deposit of silver, or by partial substitution of another metal for it. The chemistry of intensification is given under **Intensification** (*q v.*).

If, on the contrary, the negative image is too dense for the subsequent process, it is reduced by the application of a solution of potassium ferricyanide and hypo. The action that takes place here is in all probability the reduction of the ferricyanide ($K_6Fe_2Cy_{12}$) to ferrocyanide (K_4FeCy_6); the oxygen formed, combining with the silver of the image, would, as silver oxide (Ag_2O), be removed by the hypo.

The negative completed, we have next to consider the methods of making the positive print. The most generally employed method is that known as albumenized paper printing. Ordinary paper is coated over with albumen containing ammonium chloride. When dry this is floated face downwards on a solution of silver nitrate. The reaction that takes place is usually described thus:

$$AgNO_3+(NH_4Cl)=AgCl+NH_4NO_3.$$

In addition to the silver chloride formed, free silver nitrate is also present. Further, a combination of the silver with the albumen also takes place, forming albuminate of silver. The principle of the process is this—silver chloride, if exposed to the light, in contact with organic matter, is darkened to sub-chloride,

$$2AgCl=Ag_2Cl+Cl.$$

Chlorine is liberated, which, if silver nitrate be present, combines with its silver, forming silver chloride again, and free nitric acid.

The silver albuminate present is reddened on exposure to the light to a sub-oxide (Ag_4O). This when acted upon by the hypo is converted into metallic silver and silver oxide, which is to a great extent dissolved. The hypo also removes the silver sub-chloride, leaving a certain amount of metallic silver from it.

Positive prints upon albumenized paper have usually a disagreeable color. For this reason toning is resorted to. It consists essentially in the deposition of gold or other metal upon the silver of the print. The free nitrate of silver is first removed from the paper by washing, otherwise gold nitrate and silver chloride would be formed by double decomposition. The toning bath usually consists of a gold chloride solution, and any salt in which a fixed alkali is combined with a weak acid. Acetates and alkaline carbonates are capable of precipitating gold from neutral solution in the presence of organic matters. With the acetate bath the following represents the change that takes place:

$$2AuCl_3+NaC_2H_3O_2=Au_2+NaC_2Cl_3O_2+3HCl.$$

Phosphate, biborate, bicarbonate, and many other salts of sodium and potassium may be used, the action being similar in each case, *i.e.*, to deposit the gold on the silver particles of the print.

Besides gold, other metals, as uranium, platinum, etc., may be used.

In printing with gelatino-chloride papers the chemical action is somewhat similar, except that a quantity of a citrate is added to a film, forming a compound of silver citrate, and doing away with the free nitrate. Further, gelatine is the vehicle used for holding the sensitive salt in suspension, so that the silver albuminate is not formed. Prints upon gelatino-chloride paper are considered to be more permanent than those made upon albumenized paper.

In fixing prints the chemical change is very similar to that which takes place in fixing the dry plate, and which has already been described. The soluble double salts are formed Owing to the decomposing action of acids upon hypo it is advisable that the fixing bath be kept alkaline.

It is very important that after fixing, the hyposulphite of sodium be thoroughly dissolved from the film. Potassium sulphocyanide may also be used as a fixing agent. It is not superior to hypo, however, and is a violent poison.

The chemical action of bromide paper is the same as with bromide plates. The same kind of emulsion is usually employed, it being spread on to paper instead of glass.

Alpha paper is similar to bromide paper, except that a chloride is used instead of a bromide, chloride of silver being formed.*

In platinum printing the salts of platinum are reduced, that is to say, the metal is set free by ferrous salts, and ferric salts when exposed to light become reduced to ferrous.

The reactions that may be stated to take place are thus represented:

$$Fe_2 3C_2O_4 = 2FeC_2O_4 2CO_2.$$
$$3K_2PtCl_4 + 6Fe_2C_2O_4 = Fe_2Cl_6 + 2Fe_2 3C_2O_4 + 6KCl + 3Pt.$$
$$Fe_2 3C_2O_4 + 3K_2C_2O_4 = 2Fe^{iii}K_3 3C_2O_4.$$

The carbon process, and the basis of the majority of the photo-mechanical processes, depends upon the sensitiveness of the dichromates to light. In the carbon process the paper is first coated with a solution of pigmented gelatine. This is floated on a solution of potassium or ammonium dichromate. In presence of gelatine these dichromates become reduced by the action of the light, a portion of their oxygen combines with the gelatine, causing it to become quite insoluble. Thus:

$$2K_2Cr_2O_7 = 2K_2CrO_4 + CrO_3 + O_3.$$

When hot water is applied the portions unacted upon by the light which remain soluble are washed away, leaving the image in pigmented gelatine.

PHOTOGLYPHIC ENGRAVING.—A process of photo-etching invented by Fox Talbot. A metal plate was coated with gelatine, sensitized with potassium dichromate, and exposed to light under a negative. It was then dusted with finely powdered copal and warmed until this melted. When cold it was covered with suitable etching fluid which soaked through the portions of the film unacted upon by light, and attacked the plate underneath.

PHOTOGLYPHY.—See **Photo-engraving.**

PHOTOGLYPTIE.—The French name given to the Woodburytype process.

PHOTOGRAM.—A photographic image, a photograph.

PHOTOGRAPH.—A representation or picture of an object obtained by means of photography.—For the law of copyright in photography, see **Copyright.**

PHOTOGRAPHER.—One who takes a picture or likeness by means of photography. Many attempts have been made of late to draw a clear distinction between an amateur and a professional photographer. Correctly speaking, an amateur is one who follows the occupation merely for love, and without any attempt at making profit by means of same, while a professional is dependent either partly or wholly upon the art for his means of livelihood. Many are of the opinion that directly an amateur photographer sells or receives any money for his work he ceases to be an amateur and becomes a professional. The question then raised is this: If an amateur accept money for his work to partly recompense him for his expenses in connection therewith, can be no longer be considered an amateur? Provided he does not rely upon photography at all for his income, he should be classed as an amateur. (See **Amateur**.)

PHOTOGRAPHIC COPYRIGHT.—See **Copyright.**

PHOTOGRAPHIC GUN.—A small instantaneous camera used in the same way as an ordinary gun. It possesses a rapid lens with an instantaneous shutter fitted into the barrel, with an arrangement for focusing. A cylinder contains 18 plates 1½ in. diameter, which are brought one after the other into position.

---

* A small quantity of a bromide is also used generally.

PHOTOGRAPHIC OPTICS.—See **Optics, Lens, etc., etc.**

PHOTOGRAPHIST. —A photographer.

PHOTOGRAPHY.—Many attempts have been made to trace the art of photography. A lens has been found in the ruins of Ninevah, a city destroyed a thousand years before Christ. Some authorities assert that this must have been used only as an ornament by the women of the time, although it seems hardly possible that they should not have discovered the fact that images of objects could be obtained with it. The following is a slight resumé of the progress of photography, although the art itself cannot be said to have been discovered till the Daguerreotype process.

1556. Fabricius published a book on metals in which is noted that chloride of silver, or *luna cornea*, as it was then termed, darkened on exposure to the light.

1590. The camera obscura was invented by the Italian pnilosopher, Baptista Porta.

1727. J. H. Schulze obtained copies of writing in sunshine upon surfaces prepared with a mixture of a nitrate of silver solution with chalk.

1779. Scheele showed that violet light was most active in changing silver chloride. His results were confirmed by Senebier, who wrote that in fifteen seconds the violet rays blackened silver chloride as much as the red rays did in twenty minutes.

1774. Scheele discovered the cause of the darkening of silver chloride exposed to the light. He proved the effect upon it was to decompose it and cause it to give up some or all of its chlorine. He proved this by exposing it to light under water.

1795. Lord Brougham suggested in a communication to the Royal Society[*] the possibiltiy of obtaining pictures upon ivory rubbed with silver nitrate and exposed to the camera.

1802. Thos. Wedgwood (fourth son of the great potter) and Humphry Davy read a paper at the Royal Institution on copying paintings done on glass, and making profiles by means of silver nitrate. Davy discovered that chloride was more sensitive to light than nitrate of silver, and that white leather was superior to paper. These experimenters afterwards abandoned their researches for want of something that would fix the impressions thus obtained, and prevent them from further darkening when exposed to light.

1810. Seebeck is stated to have observed that when the solar spectrum was projected upon moist chloride of silver a faint impression of the natural colors was produced.

1812. Iodine was discovered by Courtois.

1813. About this time Joseph Nicephore de Niepce commenced his experiments, which resulted in the discovery of the bitumen process of photography. He coated metal plates with asphaltum or bitumen of Judea, and exposed them in the camera for several hours. The parts unaffected by the light remained soluble, and were dissolved away with oil of lavender.

1819. Sir John Herschel drew attention to the hyposulphites and the solvent power of the akaline hyposulphites upon chloride of silver.

1824. Daguerre commenced his experiments on similar lines to Niepce.

1826. Bromine was discovered by Balard. Daguerre became acquainted with Niepce.

1827. Niepce was refused a hearing at the Royal Society because he would not reveal the details of the process.

1829. Niepce and Daguerre entered into a partnership, which was continued after the death of Niepce, his son, Isidore, taking the place of his father.

1833. Niepce, the elder, died. Daguerre continued his work. His experiments in using iodine to stain the surface of the silver plates led to the invention of the Daguerreotype process.

1834. Fox Talbot commenced his researches, and in 1839 showed several pictures stated to have been made in the camera in 1835.

1848. Daguerre attempted to form a company to work his new process, the Daguerreotype. The Parisian public was perfectly incredulous, and the shares were not taken up. He then explained his process to the eminent French astronomer and physicist, Arago. On the latter's recommendation to the French Government Daguerre was awarded a life pension of 6,000 francs, and Isidere Niepce one of 4,000 francs per annum, on condition that the invention was published to the world.

1839. Notwithstanding this, a patent was taken out by Daguerre in England, in this year, five days before it was publicly announced at Paris.

In the same year Fox Talbot described his method of "Photogenic drawing." He soaked paper in a weak solution of common salt, and then brushed one side twice over with silver nitrate. Both negatives and positives were produced. The images were fixed with common salt.

Herschel pointed out the superiority of sodium hyposulphite as a fixing agent.

J. B. Reade used an infusion of nutgalls to render silver nitrate on paper more sensitive to light.

---

[*] This does not appear in the published paper; Lord Brougham stated that he did make the suggestion, but it was eliminated from the published report by the secretary.

Mungo Ponton discovered the peculiar properties possessed by potassium bichromate. He found that if paper be soaked in a solution of potassium bichromate and dried it was changed by the action of light, the chromium compound produced being insoluble.

1841. Fox Talbot patented his calotype process, which was afterwards disputed by J. B. Reade on the grounds of his previous discovery. In Talbot's process iodide of silver was used on paper. This, when required for use was brushed over with a gallo-nitrate of silver solution. The image after exposure was hardly visible but required to be developed. This was accomplished by brushing the paper over with more of the solution.

In this year Petzval invented his famous portrait lens, which was constructed by Voigtlander, and Claudet patented the use of colored media for illuminating the dark room, which was previously quite dark.

1842. Herschel described his methods of printing with salts of iron.

1844. Robert Hunt recommended ferrous-sulphate as a developing agent.

1848. Niepce de St. Victor introduced the albumen process. Glass was coated with albumen containing potassium iodide and sensitized in a silver nitrate bath.

1849. A Frenchman, Gustave le Gray suggested the use of collodion for photographic purposes.

1851. Scott Archer introduced the collodion process.

1852. Fox Talbot invented a process of steel engraving by the action of light. This he termed photoglyphy or photoglyphic engraving.

1854. Messrs. Spiller and Crookes introduced a moist collodion process.

1855. A French scientist, Dr. Taupenot, published his collodion albumen dry plate process, which found much favor.

1861. Major Russell published his tannin process.

1864. Sayce and Bolton published an account of a collodion emulsion process.

In 1871. Dr. R. L. Maddox used gelatine in place of collodion and from this sprang the present process of photographing with gelatine dry plates. It was not, however, until many years later that the advantages of gelatine over collodion were fully recognized.

This may be considered as a brief summary of the principal events that led up to the now almost universally employed dry plate process. The wet collodion process, however, is still worked in many establishments for special work where rapidity is not essential, and where brilliancy and depth of contrast are desirable.

PHOTOGRAPHY, APPLICATIONS OF.—The introduction of the modern dry-plate process, and consequently the reduction of the time of exposure to fractions of a second, has caused photography to be of great and wonderful assistance to nearly all the modern arts and sciences. Perhaps the science that has mostly benefited has been astronomy.

Astronomy.—This may be easily explained. The sensitiveness of the eye is very limited. A star placed at such a distance that with the most powerful telescope we possess it is still imperceptible will always remain invisible, but with the photographic camera it is different. By greatly prolonging the exposure, this tiny invisible ray of light slowly but surely acts upon the sensitive plate, and after a sufficient length of time (it may require hours) it reveals its image. When we glance up at the heavens on a starry night we see some thousands of stars visible to the naked eye; with the assistance of a powerful telescope we see thousands more, but by exposing a photographic dry plate for some length of time we become aware of the existence of many hundreds more of these heavenly bodies, more appearing the longer the plate is exposed. The chemical plate possesses two principal advantages over the eye. First it is sensitive to rays utterly powerless to produce any visual effect, and next it can accumulate impressions almost indefinitely, it being possible to photograph objects so faint as to be perfectly hidden from our vision. By this means only may we eventually learn whether a blank space in the sky truly represents the end of the stellar universe, or whether farther and farther still, worlds shine beyond veiled in the obscurity of immeasurable distance. Photographs of the stars were made as early as 1850 by Whipple, of Boston, and since then many thousands have been made of every region of the heavens. A complete chart is now being undertaken. For this purpose about 14,000 plates will have to be exposed from all parts of the earth, and these plates will be so arranged that when correctly placed they will form a complete map.

Some idea of the increased astronomical knowledge that has been gained by the aid of photography may be had from the fact that in Cygnus 170 stars had been carefully mapped out by the old laborious process. A photograph made recently revealed the existence of over 7,000 stars. With regard to lunar and solar photography our astronomers have not been behind. A solar Daguerreotype was made at Paris as early as 1845. In 1857 De la Rue was commissioned by the Royal Society to construct an instrument specially for photographing the sun at Kew Observatory. This instrument was used to make solar pictures or photographic records of the solar condition, and was continued for over fourteen years. For some time it has been asserted that the spots on the sun have a regulating effect upon this earth. Dr. Zeyer, of Prague, claims that by means of photographs of these solar spots he is able to predict by more than twenty-four hours the approach of tempests, hurricanes, earthquakes, etc. The transit of Venus, comets, nebulæ, eclipses, etc , have all received the attention of the camera. See **Astronomical Photography.**

Medicine. The physician is gradually recognizing the claims of photography to his attention. He is now able to photograph the eye by a flash of light so that the pupil, being previously in the dark, is dilated to its utmost, and has no time to contract before the deed is done and the image permanently recorded. Cameras are now being constructed for photographing the interior of the abdomen.* Valuable photographs, too, have been made of peculiar diseases, natural phenomena, etc., which cannot but be of great use to the medical student.

In *Chemistry*, photography has been of service in registering the belted zones of the spectrum, and making images of these bands, parts of which are invisible to the eye, and by this means not only can we obtain some information regarding the constitution of stars and nebulæ, but also some idea respecting the relative motions of these bodies and our earth.

Military Photography.—The science of warfare has also been aided by the art of photography. Balloons and kites are now constructed capable of carrying a camera with which photographs can be made of the surrounding country, the position of the enemy, strength of their fortifications, etc.

For mapping and surveying this arrangement would also be of great use.

In *Meteorology* photography assists by giving permanent records of the dark nimbus and the bright rolling cumulus clouds. The lightning flash is clearly shown as it really is. Further, it helps the meteorologist by registering for him the rising and falling of the barometer and thermometer.

In *Microscopy* we are able to photograph the disease-bearing generations of *bacteria*, *vibrio* and *schizomycetes*, and to throw these photographs on a screen so that the image of the little flea assumes the proportions of the gigantic elephant.

Indeed, the uses of photography are many. It has been used to send letters from besieged cities to anxious friends and relatives outside. It has served to photograph the action of the torpedo in throwing up the water, and to give truthful records of the field of battle. It helps the clever engineer by multiplying his plans and by giving him evidence of work done above or below the ground, determining the depths of the sea, and the directions of currents. It serves to keep in the hands of justice the image of the villainous murderer, or the avaricious forger. It detects the spurious banknote, and assists the expert in his tests of handwriting. No traveler's equipment is complete nowadays unless it contains a set of photographic apparatus, enabling him to bring back from his travels pictures of the curious things that he has seen, and the picturesque places that he has visited.

These are a few among the many things which photography does for mankind. Every year shows some fresh use for it, and it is difficult to say where it will end, if end it will.

PHOTOGRAPHY IN COLORS.—See **Heliochromy.**

PHOTOGRAVURE.—A very beautiful photo-mechanical printing process, giving soft and most artistic results. The principles of the process were first suggested to a French firm by Woodbury, the inventor of the Woodburytype, and the process was eventually worked by them with great success. There are now several different photogravure processes worked by different firms. The details of these processes are, however, kept a close secret.

The following process is not by any means a difficult one. The first operation is to prepare from the negative a transparency with special carbon tissue for that purpose, developed on a prepared glass plate. Like all other photographic processes a good negative is necessary; it should have plenty of detail, and strong without being hard. From this negative a carbon transparency is made upon glass,† and when quite dry it is placed on the retouching desk and carefully worked up. To do this properly it requires the work of an artist, who can, by touching up the details, make an artistic picture from the photograph. It is an acknowledged fact that the majority of the magnificent photogravures that are sold have required weeks, and in some cases even months, of the artists' retouching work, improving the light and shade.

The next operation is the preparation of the copperplate, which is to form the intaglio block from which the prints are made. The dimensions of the plate should be one or two inches wider each way than the size of the picture to be printed. It should be well polished, and have the edges bevelled slightly. The copperplate is now thoroughly polished, and freed from scratches by dusting over a little very fine emery powder, moistening it with a little mixture of vegetable naphtha and turpentine, and well rubbing with a piece of soft flannel or lint. When it has become bright, the emery powder is removed, and a little whiting, moistened with the turpentine and naphtha mixture, applied. With a clean piece of flannel or lint the plate is given the final polish. All traces of emery or whiting are then carefully removed.

The next process is the laying the etching ground upon the plate. For this purpose we require an apparatus constructed especially for the purpose.

It consists of a box of suitable dimensions, fitted on two pivots and with a handle, enabling it to be revolved. A small opening at the bottom fitted with a door is made in front. In the bottom of the box a number of nails are driven to rest the plates upon. The method of using this apparatus is as follows: About a pint of equal parts of very finely powdered resin and asphaltum is put into the box, the door closed, and the apparatus revolved very rapidly. The effect of this can be imagined, the resin and asphaltum dust fill the air in the box. A few seconds are allowed for the coarser particles to subside, and the door is then opened and the plate inserted and allowed to remain there for about 15 or 20 minutes. It is then removed and will be found to be covered with very fine asphaltum-resin dust. It must be very carefully handled, as the slightest draught or a heavy breath would displace the dust and spoil the effect. Directly it is removed from the box it is laid upon a heating apparatus with a temperature of about 150° F., where it remains just until the dust is melted sufficiency to adhere to the copper. A very great deal of the subsequent effect depends upon careful manipulation at this point. If insufficiently heated the dust will not melt and adhere to the plate, and if overheated the resin and asphaltum will form a homogeneous layer instead of what is required, *i. e.*, a collection of fine dust particles through the interstices of which the etching fluid can penetrate.

---

* See Photogastroscope.

† For instructions see Transparency.

The copperplates prepared in this manner can be preserved for any length of time. It is well, therefore, to prepare a number at a time and store carefully away for future use.

This method of laying the ground is probably the one most generally employed. There are several other methods, however. One is by means of an air brush, a solution of the asphalt and resin being blown on to the plate in the form of a spray.

The following two methods are also given in Wilkinson's work on Photogravure.

The ground is laid by first coating the polished plate with a five per cent. solution of camphor in methylated chloroform and a five per cent. solution of white resin in benzole mixed together. When dry the plate is laid on the heating apparatus until the camphor ceases to smell and the resin begins. It is then cooled and the ground is ready.

The other method is to oil the copperplate with olive oil; then to dust over with flower of sulphur and allow to remain a few hours, when a slight tint will be etched all over the plate, more or less deep in proportion to the time given. These plates must be cleaned with ammonia before the next stage.

Bay salt	2 parts
Ammonium chloride	1 part
Verdigris	1 part

ground into a fine powder, mixed with syrup of honey, also gives a good grain,* and may be used after etching to vary the tint.

We have now the retouched transparency and the prepared copperplate. The transparency is placed in a printing frame, a mask with an opening the size of the picture required laid over it, and a piece of ordinary carbon tissue placed over this, so that the image comes exactly in the center. The frame is then closed up and exposed to the light.

The exposure is regulated by an actinometer (see **Carbon Printing**), as the image is not visible till development.

When sufficiently printed, it is removed from the printing frame and laid in a dish of clean cold water. On immersion in the water the tissue will curl up, and afterwards return to a flat state. It is then removed and squeegeed down on to the prepared copperplate; a few pieces of paper and a heavy weight are then laid over it to press it well down for a few minutes. It is then immersed in warm water about 90° to 100° F. until the paper back becomes loosened and can be readily removed. The temperature of the water is then slightly increased, and the plate laid within until the soluble gelatine is all washed away. The temperature must be raised to about 105°, or if the print is over exposed it will require to be about 110° or 115°. When only the insoluble image on pigmented gelatine remains, the plate is rinsed under a tap and placed in a rack to dry; when quite dry the margin of the copperplate is carefully covered with a black varnish, and the plate laid in the etching solution, which consists of—

Saturated solution of perchloride of iron in methylated spirits	5 ounces
Water	10 ounces

The effect must be very carefully watched. Directly the whole of the protected copperplate beneath the carbon image is discolored by the action of the etching fluid the plate is removed, well washed, and the carbon image wholly removed with a brush dipped in a strong solution of sodium carbonate. The etching process occupies a few minutes only, and therefore requires close attention. The discoloring action of the perchloride of iron is carefully followed first in the shadows, next in the half-tones, and lastly in the high-lights. It should be noted that in the carbon image or "resist," as it is termed, the high lights are opaque, and the shadows transparent. When the action of the etching fluid has reached the light it must be immediately stopped in the manner described.

The action of the fluid is not to deeply etch the plate, but merely to roughen it sufficient to hold the ink when printing. Its strength depends upon the quality of the image. A strongly concentrated solution works slower than a diluted one, so that it is preferable to commence with a moderately strong bath and dilute until the plate is properly etched.

---

* "Photogravure," by W. T. Wilkinson.

The image and the varnish removed, the next operation is to polish the margin with fine emery cloth, the edges of the picture being protected with a straight edge. The plate is then ready for the printing press.

An ordinary copper-plate press will be required, fitted with two blankets, a thick one next the rollers, and a thin one underneath.

In printing from photogravure plates the ink must be strong in color and in oil. It is applied to the plate with a dabber made of soft cloth or flannel, rolled up about four or five inches long and one inch in diameter. The paper used for printing on should be a good quality of plate-paper. Every sheet must be wetted over with a wet sponge and stacked for a few hours under pressure.

The plate is first cleaned with a mixture of turpentine and naphtha and wiped quite dry. It is then laid on the heating apparatus and warmed until the hand can no longer stand the heat. A little is then put on the dabber, and worked well on the inky slab. The plate is then dabbed all over, and the ink worked well into the engraving with a piece of coarse French muslin warmed, the ink is carefully removed from the margins and whites, and a piece of fine muslin is then warmed, and made into a cushion sufficiently large enough to lay on the palm of the right hand; with this the plate is lightly wiped until ink is apparently left in the depths of the picture only. If the ink is cold it adheres firmly to the plate, hence the necessity of warming the muslin. After properly wiping, the margin of the margin of the plate is cleaned with a piece of rag dipped in turpentine. The plate is then laid in the press, and the print made.

To pull off good prints from a photogravure plate requires a considerable amount of practice. The plate can, if necessary, be further improved by working the high lights with a burnishing tool and strengtheing the shadows with a roulette.

If a number of prints are to be made from one plate it will be necessary to face it with steel. The method given by Wilkinson is the following: The plate is thoroughly cleaned with whiting, moistened with turpentine and naphtha, and polished with a soft cloth. A small portion of the plate is scraped clean, and a piece of copper wire soldered to it. The steeling solution is placed in a wooden cell, the positive and negative poles from a Léclanche battery ending in copper rods the whole length of the cell. The solution is composed of:

Warm water	20 ounces
Ammonium chloride	3 ounces
Iron sulphate and ammonia	4 ounces

When dissolved, filter, and let it stand in the cell twenty-four hours before use. The copperplate is hung upon the rod connected with the negative pole* of the battery, the positive pole being attached to a plate of pure steel about the same size, or a little larger than the copper-plate. When the two plates are in position the current is turned on. Three to five minutes suffice to complete the operation of covering the copperplate with a fine thin film of steel. The plate is removed, thoroughly washed and cleaned with whiting and turpentine and naphtha solution. The copper wire is unsoldered and the back scraped flat.

Prints should be dried separately, then slightly damped and laid between sheets of tissue paper, and placed under pressure till dry again.

If a title or name is required to be printed on to the plate, the whole must be coated with a thin film of bitumen varnish. The letters are then made with an etching needle, which must go right through the varnish, and the title written backwards, of course. It is then immersed in the etching solution for a few minutes, the varnish removed, and the plate is ready for the printing press.

There is another process of photogravure, the details of which are kept a profound secret. In this the translation of photographic half-tones into the corresponding grain required for printing is said to be effected by the aid of a substance which crystallizes when exposed to the light, the size of the crystals depending upon the amount of light received. Such a substance exposed under a negative will give a surface the grain of which will exactly correspond with the lights and shades of the picture, and from which an electrotype can be made for printing purposes.

PHOTO-HELIOGRAPH.—An instrument used in astronomical photography (*q.v.*).

PHOTO-LITHOGRAPHY.—It will perhaps be as well, before describing the process of photo-lithography, to give some outline of the theory of ordinary lithography. This was invented by Senefelder, who was the first to discover the remarkable properties of the Solenhofen limestone. It is said that, for want of paper and ink to write to his mother, he casually used the surface of this stone instead of paper, using a mixture of soap, wax, and soot for ink, having the intention of copying on to paper at a convenient opportunity. When about to efface the writing the thought struck him, why not etch the stone with an acid. He tried this, and was delighted with the result he obtained.. From this he built up the whole process of lithography.

The action of the acid is to etch away a very thin layer of the unprotected stone, while the writing remains intact, but naturally left a little in relief. In addition to this effect of the acid it forms upon the surface of the stone, where attacked, nitrate of calcium, which possesses the property of resisting and refusing the fatty ink upon the surface of the roller.

---

* In a Léclanche cell the zinc is the positive and the carbon the negative.

Lithographic stones are prepared by cutting into slabs and grinding and polishing the surfaces. The chalk with which the drawing is made on the stone is composed of soap, wax, tallow, and shellac, with finest lampblack added for color. These ingredients undergo a change, and form with the stone a very stable chemical compound. The fatty acids (oleic and margaric acid) are set free from the soap and tallow by the nitric acid, and combine in the nascent state with the lime to form oleomargarate of lime. This compound adheres firmly to the stone, and by applying turpentine the image may be apparently completely removed from the stone. It is not, however, for if the ink roller be again applied the very finest details will be found to have remained intact, and make their appearance by the ink adhering to the oleomargarate of lime, and refusing to adhere to the stone, which, by the etching process, has become wet with nitrate of calcium.

This is then the theory of lithography simple. In photo-lithography we substitute a photographic image for the artist's drawing.

Bitumen Process.—The very earliest process was discovered by Niepce even before the discovery of photography itself. This process was based upon the peculiar property possessed by asphalt or bitumen of becoming insoluble in either benzine or turpentine if exposed for some time to the action of light, these agents readily dissolving it if unexposed. The lithographic stone, poured over with a solution of asphalt dissolved in turpentine in the dark-room, is dried and exposed under a reversed negative to the action of sunlight for several days. By means of turpentine or benzine the unexposed parts can then be dissolved away, leaving an asphalt image of the exposed parts, which can be inked in and etched in the ordinary manner. Owing to the perfection attained by the transfer method now generally employed, this process is not much used. The method of obtaining the image in asphalt is, however, generally adopted for heliographic engraving or etching on copper or steel plates.

The special photographic application of this group of coloring matters to be described depends firstly upon the sensitiveness to light of their diazo-derivatives, this sensitiveness being increased in a very remarkably degree by combination with the complex colloids which constitute the textile fabrics. The actual photographic agent is the diazo-primuline, in which form the image is produced, and the development of the image consists in its conversion into any of the coloring matters obtainable by combination with phenols and amines. It will be obvious that the images produced will be positives.

Direct Photo-lithography.—The bitumen process may be said to be a direct process. Another is the following:

The polished stone is spread over with a solution of gum-arabic and potassium dichromate. It is then dried in the dark, and exposed under the negative. After this the stone is well washed and rolled in with ink. There are one or two other methods of directly printing the image upon the stone; none, however, have come into practical use, or superseded the photo transferred from paper.

Transfer Method of Photo-lithography.—In this a sheet of paper is coated with gum, albumen, or gelatine containing potassium or ammonia dichromate. It is then exposed to light under a negative, and after exposure is uniformly coated with printers' ink. This inked paper is then immersed in warm water, and the surface gently rubbed with a soft brush, which removes the ink from the parts not acted upon by the light. Where the light has rendered the colloid substance insoluble, it retains its hold of the ink The image in printers' ink is now called a photo-lithographic transfer.

Success in photo-lithography depends to a considerable degree upon the quality of the negative and of the paper used for making the transfer.

The old wet-collodion process is the most suitable for the production of the negative, as great density and contrast are essential. To produce a perfect negative for this purpose requires a great deal of practice. Not only must every line in the copy be faithfully reproduced in the negative, as clear glass and the white ground have considerable opacity, but the utmost sharpness possible of every dot and line is also necessary. If gelatine plates be used they should be very thickly coated. Professor Burton recommends the following emulsion for dry plates, especially for photo-mechanical line negatives.

I.

Ammonium bromide	1,000 grains
Potassium iodide	80 grains
Gelatine	320 ounces
Water	40 ounces

II.

Silver nitrate in crystals	1,600 grains

III.

Hard gelatine	1,200 grains

No. 1 is raised to a temperature of about 120 deg. F., and No. 2 added (dry), stirring continuously. No. 3 is then added, also in a dry state. When the whole is melted the emulsion is precipitated with alcohol and washed, or it may be allowed to set and then washed.

The paper used in making the transfer should be smooth, well sized and with plenty of body. In this country that known as bank post paper is generally employed. Professor Husnik's process for preparing it is as follows[*] :—One part of finest gelatine is swelled and then dissolved in 24 parts of water, a solution of chrome alum, 1 in 100 of water, is then added, and the solution while still warm is poured into a large zinc dish heated to 34 deg. R. by means of a petroleum or spirit lamp. The scum is first removed from the surface of the solution, and the paper floated, one sheet at a time, and hung up to dry. The sheet is floated on the gelatine solution a second time, and again suspended, this time by the diagonally opposite corner to the one by which it was previously hung. A solution of white of egg one part, water two parts, is next prepared, and the paper floated on it. After again subjecting to the drying process it is ready for sensitizing. This is done with a bath of—

Water	14 parts
Potassium dichromate	1 part
Methylated spirit	4 parts

with sufficient ammonia to turn the reddish solution to a bright yellow one. After floating it is dried by hanging up in the dark.

Another method of preparing a gelatine transfer paper employed in the Military Institute in Vienna is thus described.[†] A sheet of well sized paper is laid in a dish of water to soak, and when quite limp it is drained and place on a glass plate made perfectly level All air-bubbles and superfluous moisture are removed by means of blotting paper and a squeegee. The edges of the paper are then turned up about 2 c.m. all round, and a warm solution of gelatine (1 in 30) poured on. In a few minutes the gelatine will have become quite set, and the sheets are laid on wire netting to dry, the operation requiring usually about two days. A day previous to using, the gelatine paper is sensitized by immersing in a cold bath of potassium dichromate and water (1 in 15). On removing from this bath it is allowed to drain, and the gelatine side placed on a glass plate. The back is then dried with blotting paper and all air-bubbles removed. These operations and the drying afterwards must be done in a non-actinic light. To prevent the sheets when dry from adhering either partly or wholly to the plate, it is advisable to wax the glass or apply to its surface a weak solution of oxgall.[‡]

In the Calcutta Government Photograph Office a new method of preparing the photo-lithographic transfer process has been introduced, arrowroot being used instead of gelatine. Bank post paper is coated in the usual way with two coatings of the following mixtures :—

Arrowroot	140 parts
Potassium dichromate	70 parts
Water	3,500 parts

After exposure to light the prints are coated with transfer ink in the press as usual, the transfer ink used being composed of—

Hard re-transfer ink (plate to stone)	100 parts
Lithographic chalk ink	100 parts
Palm oil	7 parts

After inking, the prints are washed off with hot water, hotter than is required for gelatine transfers.

When transfer paper is not prepared in large quantities, ordinary commercial gelatine paper, or the double transfer paper used in the carbon process, may be used if prepared by floating on a bath of albumen (beaten to a froth and allowed to stand) 50 parts, water 50 parts, and potassium or ammonia dichromate 7 parts. On this the paper is floated for a few (about five) minutes. The solution will not keep.

All sensitized transfer paper should be used as soon after sensitizing as possible. As soon as dry it is exposed under the negative for a few minutes in sunlight when possible. The image appears of a brownish-gray color on a yellow ground, and may be examined by a non-actinic light. When all the detail is visible it is removed from the frame.

The room in which the operations of sensitizing, drying, inking up, etc., are carried on, must be lighted by windows covered with golden fabric or by gas or lamplight.

After exposure, the transfer is then inked up. A little photo-transfer ink is mixed with turpentine, and the glue roller charged with it until the whole sheet is uniformly covered with ink. It is then placed in a dish of cold water, and allowed to soak for some minutes (about a quarter of an hour will usually suffice). It is then laid on a smooth slab, and carefully rubbed with a pad of wet lint until the whole of the loose ink is washed away. The photo-litho transfer may also be put down in the same manner on a zinc plate, and then treated in the same manner as the stone. The effect of this is that the printer's ink becomes removed from all those parts unexposed to the action of the light, and an image in fatty ink is obtained on the gelatinized paper. From this the superfluous moisture is removed with blotting paper, and the print, ink face downwards, is laid on a clean and slightly warmed lithographic stone. Both are then passed through the press, and the transfer adheres firmly to the stone, but by moistening the paper with a sponge it becomes easily removable. When stripped from it the fatty ink will adhere to the surface of the stone, leaving a perfect reversed image on it. The stone is then gummed and etched in the ordinary manner employed in the process of lithography.

---

[*] See "Collotype and Photo-lithography," by D. J. Schnauss, translated by E C. Middleton.

[†] "Photographisches Correspondenz.

[‡] A more reliable method of imparting to the surface of the paper a high gloss is to squeegee it down upon a ferrotype plate, the surface of which requires no preparation, and the risk of sticking is *nil*.—E. C. Middleton.

PHOTO-LITHO TRANSFERS.—See **Photo-lithography.**

PHOTO-MECHANICAL PROCESSES.—The term photo-mechanical is applied to all processes in which the action of light upon chemical substances becomes the means of preparing printing surfaces from which many impressions can be made without any further assistance of light.

The first photo-mechanical process known was that invented by Nicephore Niépce about 1827, when he discovered the peculiar sensitiveness of asphaltum to light. He coated metallic plates with a solution of this substance, and exposed them in the camera to the image. Those parts acted upon by the light became insoluble, while the remaining portions were dissolved away with oil of lavender. By this means a reversed picture of bitumen was obtained on the metal plate. By next applying an etching acid the parts of the metal unprotected by the bitumen image were eaten into, and after clearing away the image a printing plate was obtained.

Many photo-mechanical processes are based upon this property of asphaltum, but many more upon the sensibility of dichromatized gelatine, albumen, and gum arabic, and their peculiar properties. These substances are used to produce the design, either flat for etching or direct printing, or in relief for moulding electrotypes, stereotypes, etc.

For some time the chief difficulty that was encountered was in the correct rendering of the half tones. This was eventually overcome by breaking up the image into lines, dots, or stipples.

Photo-mechanical printing processes may be divided under two different heads, *i.e.*, those in which the image is moulded in pigmented gelatine, and those in which the picture is printed with the ordinary fatty printing inks. To the first class belong the Woodburytype and Stannotype processes.

The *Woodburytype* was the invention of W. B. Woodbury. In this a sheet of bichromatized gelatine is first exposed under the negative, and afterwards washed in warm water, which removes the soluble parts, leaving the image in relief. When the gelatine relief is dry it is exceedingly hard, and is pressed by means of hydraulic pressure into a sheet of lead. By this means an intaglio mould is formed. This is placed in a specially constructed press, having a heavy and perfectly true lid. A little warm gelatine solution, containing any desired pigment, is poured on to the intaglio mould, a piece of prepared paper laid on top of it, and the heavy lid brought down. This squeezes the excess of colored gelatine, allowing only that to remain which lies in the mould. This sets, and at the same time adheres to the paper support, which, when removed, has attached to it the gelatinous image. This is dried and hardened with chrome alum. If glass be used instead of the paper very beautiful transparencies can be made.

The *Stannotype* process is a modification of the Woodburytype by the same inventor. In this tinfoil, properly backed by electrotyping or by other means, is substituted for the lead plate, thus doing away with the necessity of employing expensive machinery.

A very large number of processes come under the second classification, *i. e.*, those which are printed in ordinary printer's ink. These, however, may be again divided into the following: (1) Processes in which the image is printed from a gelatine surface. (2) Processes in which the picture is printed from stone. (3) Processes in which the image is printed from a metallic surface in relief. And (4) processes in which the image is printed from an intaglio metal plate.

Among the processes in which the picture is printed from a gelatine surface the chief are: Collotype or Albertype, Artotype, Chromo-collotype, Indotint, Leimtypie, and Heliotype.

In the *Collotype* process a sheet of thick plate-glass is first coated with a film of albumen and gelatine, to which a dichromate has been added. This is then laid on a piece of black cloth exposed to light, washed and dried, and the plate is then coated with dichromatized gelatine, exposed under a reversed negative, soaked in water to remove all soluble chromium salt, hardened with alum, and finally dried. By this means a scarcely visible image in gelatine is the result, those parts which have been exposed to the light being insoluble and repellant for water, the remaining parts retaining their absorbing properties. The plate is fastened to the bed of an ordinary lithographic press, the printing being very similar. A wet sponge is used to moisten the absorbing parts of the gelatine (the whites in the picture), and an ink roller inks the image part. A sheet of paper is laid over it, and, after pressure is applied, the ink is transferred to the paper. Prints may also be made upon cotton and silk fabrics.

The *Artotype* process is very similar to the Collotype, a slight improvement being made by Obernetter. A mixture of soluble glass and albumen was used for the foundation film, thus avoiding the necessity of first exposing to the light. In all other respects the process is similar to the Collotype.

Chromo-collotypes are produced with a number of Collotype plates, using differently colored inks. The negative to be reproduced is first blocked with opaque varnish in all parts except those required to be reproduced in a certain color. From this a collotype plate is made to be used with that colored ink. The varnish is then removed and the negative blocked for another color, and so on. In printing, the paper is passed through with the different plates until all the colors have been printed on it, forming a complete many-colored image. Instead of blocking out the negatives they are sometimes made by photographing the object through different colored screens, which have the effect of shutting off or absorbing some colors and allowing others to pass through undisturbed to the sensitive photographic film.

The *Indotint* process was invented by Roche, of New York. A copper plate is used, roughened by exposure to the sand-blast, causing the sensitive film to firmly adhere. The film is also roughened by the addition of alcohol to the dichromatized gelatine. After exposure the unaltered dichromate is removed by washing, and the plate dried.

Leimtype.—This process was invented by Husnik, of Prague. He takes a thick plate of chromatized gelatine and exposes it under a negative. This is then attached to gutta-percha, zinc, or wood as a foundation. The image is next developed with a solvent such as a saturated solution of alkaline dichromate. This has the double effect of dissolving the unexposed parts, and deepening and strengthening the relief. The high lights are protected, and the relief again exposed to the light, after which it is again developed to deepen the whites and further strengthen the image. Plates thus produced can be used in the ordinary printing machine with the letterpress. Electrotypes can also be made from these plates when a very large number of copies is required.

The *Heliotypie* process is closely allied to the Collotype. The most important difference is that the gelatine film containing the image is hardened with chromic alum, and detached from its support. It thus forms a thin sheet or "skin," as it is termed, which can be laid on to a zinc plate, or attached to the cylinder of a printing machine. Further, it can be easily preserved for printing from on future occasions when desired.

In our next class, *i.e.*, those processes in which the image is printed from stone, we have to mention the following:—Photo-lithography, ink-photo process, and the photo-caustic process.

In *Photo-lithography* an image is either made upon the stone direct, or first upon specially prepared paper and afterwards transferred to the stone. The transfer process is the one most general. A full description of the process will be fonnd under **Photo-lithography.**

The *Ink-photo* process is a method of photo-lithography in half-tone. The process was invented by Sprague, of London, the details being kept a secret.

Photo-caustic is the name given to photo-lithographic images in half-tones by means of a Meisenbach veiled negative.

With regard to those processes of typographic or block printing where the image is printed from a metallic surface in relief, they may be conveniently divided into two divisions, *i.e.*, the swelled gelatine processes and photo-etchings. Under the first we have the photo-electrotype, photo-engraving, and Mosstype processes. There are a very large number of photo-electrotype processes, differing in minor details. The process may be briefly described as follows:—A sheet of chromatized gelatine is exposed under a negative. Parts are thus rendered insoluble and incapable of absorbing water, the remaining portions, protected by the image of the negative, being soluble and capable of absorbing cold water. After exposure the gelatine is immersed in cold water, when the absorbing parts swell up, or else the soluble parts are removed with warm water, acetic acid, or other solvent. The next process is the making of moulds in wax, or plates from the gelatine image; and from these copper blocks can easily be made for typographic printing by the electrotype process. If half-tones are to be represented the negative must be broken up into lines, dots, or stipple.

The term *Photo-engraving* is applied to processes of making metal relief blocks. The manipulation is somewhat similar to that just described. A full description will be found under **Photo-engraving.**

The *Mosstype* process is a photo-engraving process, differing slightly in detail from that described. This is first made in a composition of asphaltum, sulphuretted resin, and caoutchouc, and from these a second mould of plaster is made, from which a casting is made in type metal to form the printing block.

Among the photo-etching processes are photo-zincography, zincotype, typogravure, and chromo-typogravure.

The term *Photo-zincography* is one that is applied to many differently detailed processes in which designs in adhesive transfer ink are transferred to zinc plates in the same manner as transferred to stone in photo-lithography. An etching agent is then applied which eats into the zinc at the unprotected parts, producing the design on the zinc in low relief. See **Photo-zincography.**

In *Zincotypes* the zinc is first coated with bitumen or bichromated gelatine or albumen, and exposed under the negative. The image is then developed. If the bitumen process is employed, oil of turpentine is used as the solvent, but in the other method the albumen is first coated with printers' ink, and then developed by gently rubbing in cold water with a tuft of cotton wool. The unprotected parts of the zinc are then washed away.

For producing these blocks in half-tones a variety of methods are employed of breaking up the negative image.

The *Typogravure* process is a method of obtaining half-tone pictures from copper relief plates, worked by Messrs. Boussod, Valadon & Co., at Asniéres, near Paris. The details of the process have never been published. Chromo-typogravures are produced by the same means, a number of different plates being used with different colored inks to form the many-colored image.

In the last class, *i.e.*, those processes in which the picture is printed from an intaglio copper-plate, we have photogravure, Goupil-gravure, and photo-aquatint. The idea of producing copper intaglio plates by means of photography was first worked out by Niepce; many others followed. About 1870 or '71 Woodbury suggested to Goupil & Co. a method of photogravure which was taken up and worked by that firm with great success. A gelatine relief was made in the same manner as for the Woodbury-type process, except that a fine gritty powder was added to the gelatine to give the necessary grain. From this relief a mould and an electrotype are made. Other processes are described under **Photogravure.**

The *Goupil-gravure* process is a method of making *facsimiles* of water-color drawings. The plate is carefully inked in by hand with the different colored printing inks, and the picture printed by one impression. The plate is cleaned and again inked for the next picture. The method of printing is, of course, very costly, as skilled artists have to be employed for coloring the plates. The results, however, are truly fine, and in some cases hardly distinguishable from the original water-color drawing.

By the *Photo-aquatint* process images are made from intaglio copperplates in a similar manner to photogravure. It is chiefly used for the reproduction of portraits taken direct from life.

This sketch of the different photo-mechanical printing processes is necessarily very incomplete. Correct information regarding these is very difficult to obtain; all firms working the processes naturally keep the details as close a secret as possible. More detailed descriptions of the most important are given in their respective places.

PHOTOMETER.—A contrivance for calculating the intensity of light. See **Actinometer.**

PHOTOMETRY.—The process of measuring the relative amount or intensity of light emitted by different sources.

PHOTO-MEZZOTYPE.—A photo-mechanical printing process similar to Collotype.

PHOTO-MICROGRAPHY.—The science of photographing microscopic objects. Considerable strides have been made in this within the last few years, and the aid given to the microscopists is incalculable. Hitherto skilled artists were required to draw what was visible to the eye. This was in most cases a difficult matter, as the structure of nature's works is so intricate and delicate that magnified objects could rarely be reproduced by hand with fidelity. By means of photography, however, we get faithful images of the objects in a few seconds.

In practice we require three essential things. These are: A camera, a microscope, and a lamp. Many arrangements have been devised for photographing microscopic objects. The simplest is a small camera made to fit on to the upper end of an ordinary microscope in place of the eye-piece. Fig. 333 illustrates a more perfect form of photo-micrographic camera.

The microscope used should be a firmly-built solid monocular with a fine adjustment. The light used must be accurately centered, otherwise one side of the object will be dark and fuzzy.

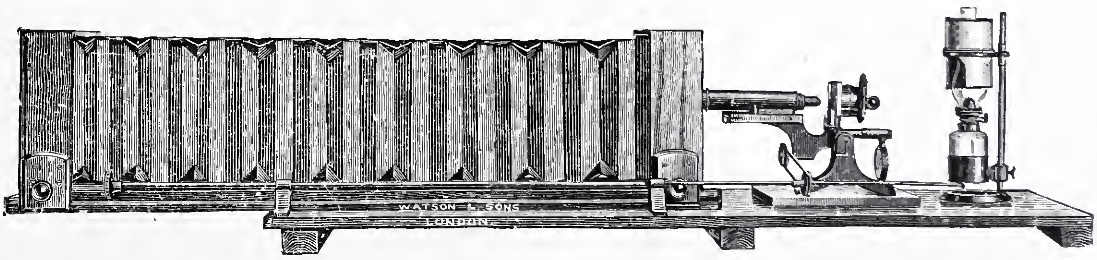


FIG. 333.

The tube of the microscope should be coated with a dead-black varnish or lined with dull black paper.

The light can be an ordinary microscope lamp burning best paraffin oil containing a little camphor dissolved in it to increase the brilliancy of the illumination.

Another indispensible adjunct is a substage condenser fitted with a revolving series of stops.

Before attempting to focus, the lamp should be allowed to burn for ten minutes, so that the whole instrument may become thoroughly warmed throughout, otherwise the expansion will alter the focus very considerably. Great care must be taken in focusing the object as sharply as possible. Charters White recommends the removal of the ordinary glass focusing screen, replacing it by a plain glass, having some fine lines drawn across it with a writing diamond, these lines being placed next the objective. The focusing glass is then set until these lines are sharply defined. These lines will closely approximate to the plane of the emulsion on the sensitive plate, therefore if the details of the object are in focus with the lines on the focusing screen, the probability will be in favor of a sharp image on the negative.

With regard to the exposure. This varies in proportion to the magnifying power of the objective used, and the color of the object itself. The times in the following table (by Walmsley) may be considered as approximate, but variable with the color and general character of the object to be photographed.

$1\frac{1}{2}$ inch objective	3·45 seconds
$\frac{2}{3}$ inch objective	7·90 seconds
$\frac{4}{10}$ inch objective	$\frac{1}{2}$·3 seconds
$\frac{1}{5}$ inch objective	2·7 seconds
$\frac{1}{10}$ inch objective	4·10 seconds

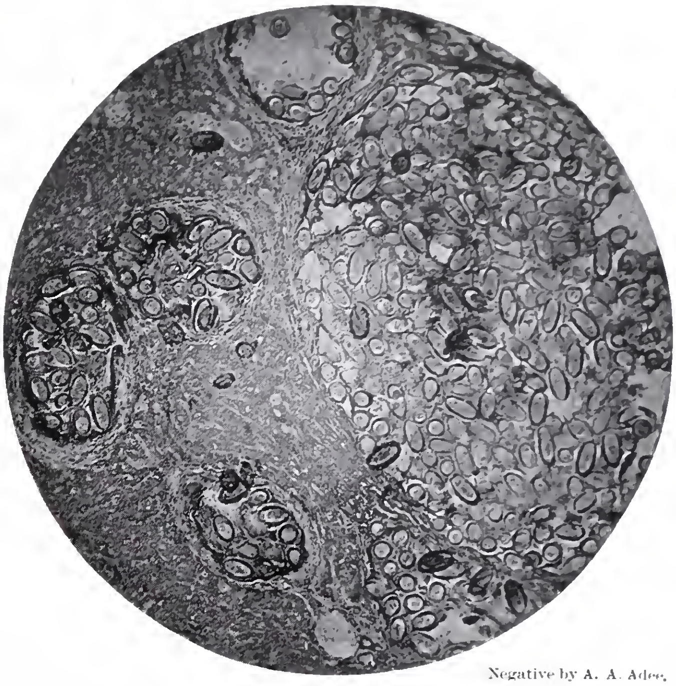
Experience only will teach the correct exposure, however.

Mr. A. A. Adee, writing in the "American Annual" for 1895, gives some valuable hints to those desirous of studying this fascinating branch of our art. He says: "While the attainment of the highest results in microscopic photography demands signal proficiency and an outlay running far into the hundreds, any possessor of a fairly good compound microscope and a small camera can produce pictures at once interesting and meritorious. It is a mistake to suppose that an elaborate stand with modern apochromatic objectives and illumination by heliostat or calcium light is requisite, except for the most advanced bacteriological and diatomic work. Indeed, it would be a positive drawback to the mere amusement seeker to have so expensive an outfit, for he must needs undergo a year or two of professional tuition or wasted experiment before reaching critical success.

"I long shared the general belief and postponed any essays in this tempting direction until I could get an eight hundred dollar apparatus, thereby missing several winters of singularly interesting pastime. Having a good Nachet stand with mechanical stage and a well seleeted set of objectives, and also a discarded 4 x 5 camera, it at last occurred to me to put them together and try conclusions therewith. A stout base-board, four feet long and six inches wide, slotted along the middle and set on turned four-inch legs, gave a good beginning. To this five suitable blocks of wood were fitted, each having a screw-pin passing through the basal slot and fastening by a thumb-nut. To the rearmost block the camera was pivoted, a paste-board funnel with black-velvet lining being attached to the front, so as to allow some two feet draw. To the next block the microscope was firmly clamped, the eye-piece being, of course, removed, and the open tube being joined to the little end of the funnel by a light-tight sleeve of velvet. The third bore a big bull's-eye condenser, and the fourth a heat and light filter. The heat-filter gave a world of trouble, but a six-inch ring cut out of half-inch all-rubber steam-packing, with plates of stout glass generously cemented to each side by means of a paste of red lead and gold size, supplied a water-tight cell, a hole being bored in the rubber wall to admit of filling it. A flat-sided pocket flask of clear glass, holding half a pint. was afterwards found to do nearly as well. It should be filled with a strong (40 per cent.) solution of copper *nitrate*, to which a grain of chromic acid is added, giving a practically monochromatic blue-green light that does not call for the long lamp-light exposure needed by the yellower liquid usually employed for modifying direct sunlight. One can't get along without a heat-absorbing cell, even if it only contains pure water; if it be omitted the warmth of the condensed lamp rays will often melt and ruin a balsam-mounted slide, or, at least, cause it to run, thereby shifting the object and yielding a panoramic effect, which is disheartening in a negative. On the last block came the lamp, a common, low-bodied kerosene hand-lamp, with a two-inch flat wick and a roomy chimney of the Rochester pattern. It was set with the edge of the flame toward the microscope, and the inside of the chimney away from the flame, was coated with a round patch of smoke from a wax gas taper, so as to avoid reflection. A reflector behind the source of light ought not to be used, for the beam is thereby so broken up as to throw a distorted pencil, and what is gained in light is lost in definition. Care was taken to so adjust the thickness of each supporting block that the optical axis of the whole system ran truly from the flame, through the tube of the microscope, to the focusing screen. To the center of the latter, on the ground side, a one-inch cover circle was cemented with balsam in order to focus the image on the transparent spot by means of a set lens.

"Proper illumination is the most difficult thing to obtain, and withal the most indipensable. An unmixed ray from the edge of the flame, passing perpendicularly through the filter-cell and evenly converged on the object by a good bull's eye with the flat side turned toward the stage of the microscope, will give a large, level field of well-focused definition. A broken ray, full of cross refractions and unevenly condensed, shows only a small patch of moderate sharpness, and even in that, spectral diffraction borders are apt to appear. These ghosts will sometimes spoil an otherwise perfect negative when the flame wavers in a draught. A 'critically' disposed light is surprisingly different in its effects from one 'uncritically' adjusted. The minute hairs on a house-fly's wing afford a simple test—under a quarter-inch objective, if badly lighted, they show double points diverging from their base.

"The fine adjustment of the microscope must be attached to some adequate contrivance so as to be readily operated while the observer stands before the ground-glass screen. A side-rod, with milled head at the hither end and a pulley wheel at the other, from which a thread band passes over the milled head of the micrometers crew, is pretty, but bothersome to apply, and not as sensitive to manipulate when the higher powers are employed as is the more primitive device of a stout thread with a weight at each extremity. This is waxed in the middle where it runs over the micrometer head, and thence passes through guide rings at the sides of the general base-board to the operator's hands, where the weights hang right and left, convenient to the slightest touch.

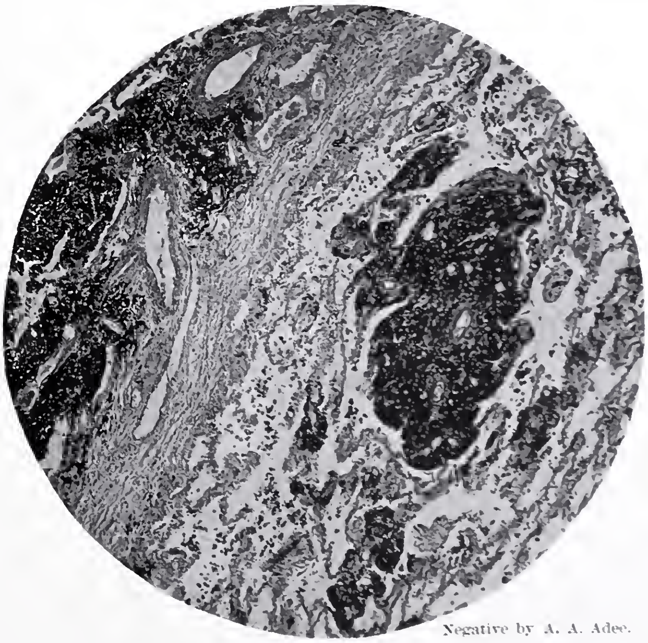


Negative by A. A. Adee.

FIG. 334.—LIVER OF MOUSE, EGGS OF TRICOCEPHALLS. × 100. REICHERT, 8MM.

"This inexpensive apparatus permits of really excellent photographs of thin sections being taken with objectives of from two inches to one-third inch focus. The resultant magnification depends, obviously, on the distance of the screen from the objective. I find thirty inches a favorable length, as it gives a circle of nearly four inches. If a greater distance be essayed, the light will be correspondingly diminished and longer exposures required, while the gain in amplification is balanced by some loss of sharpness.

"For the higher powers, one quarter to one-eighth inch, a good substage condenser should be used on the microscope itself, and the bull's eye discarded. The common non-achromatic Abbe condenser works fairly well, especially if the angle of the illuminant cone be diminished by removing the smaller top-lens of the combination; but for 'critical' work an achromatic Abbe must be used. With its employment, however, as with marriage according to the old rhyme, one's trouble begins, for it will not do its best unless the pencil of light impinging on its lower face be practically parallel. How to get a straight ray of strong lamp-light is a problem which the makers have not yet volunteered to solve satisfactorily, but it should not be a hard one. Sun-light and a calcium burner, both of which throw parallel rays, being out of the question for me, I have taken a powerful projection lantern and set it as near to the microscope as the intervening heat-filter will permit. As the beam from its projection-lens is a divergent cone, I necessarily lose the greater part of the emitted light, but that which follows the axial centre (no bull's eye being used) proves sufficient for my needs, and the achromatic Abbe condenser does the rest. What I want is a substitute lantern-objective which

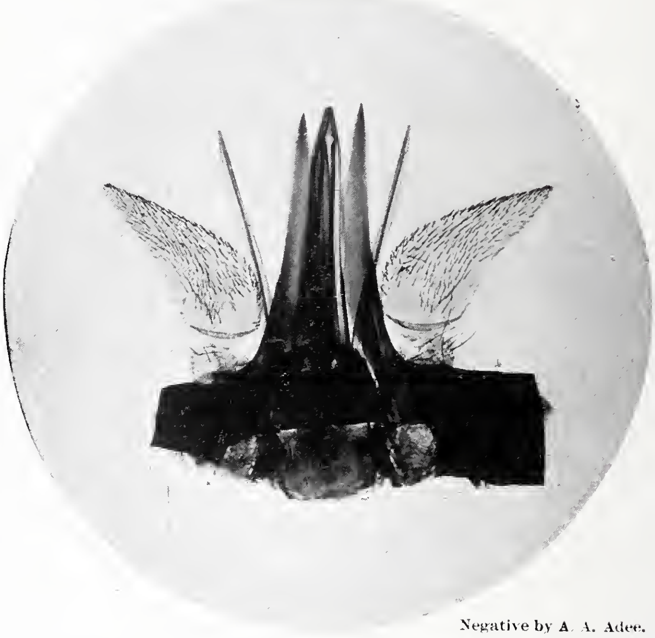


Negative by A. A. Adee.

FIG. 335.—ANTHRACOSIS OF LUNG. × 40. BAUSCH & LOMB, 3/4-INCH, SERIES II.

will collect all the light from the four and-a-half-inch condenser and project it in a parallel ray about an inch in diameter upon the base of the Abbe.

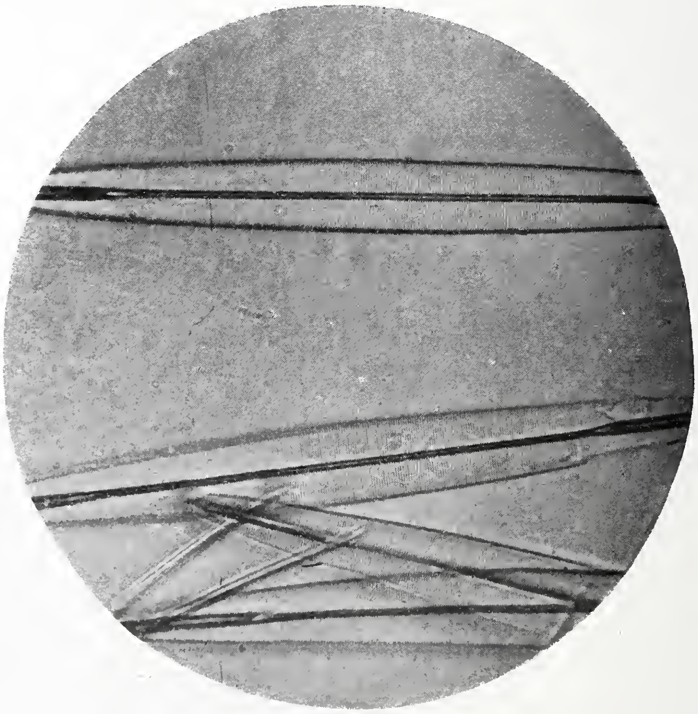
“Equally with correct illumination, a good objective is essential to creditable work. One of the very best I have is a Bausch & Lomb half-inch with an iris diaphragm set in its tube between the two combinations. Another excellent glass is a Reichert 8-millimeter ‘half apochromat,’ which shows a larger and flatter field than the full apochromats, giving at 31 inches sharp four-inch circles with a magnification of 100 diameters. There is no occasion for the mere amateur to spend a small fortune on the high-priced apochromats, since almost any first-class achromat of reputable American or English make will do the business as well, even though not especially corrected for photography. Besides being, from the peculiarities of construction, liable to mishap or deterioration, the apochromat field is purposely smaller and less flat, needing compensation by a specially computed eye-piece; and they work slower. Having an excessive numerical aperture, their working distance is narrow and with a conjugate focus of 30 inches to the screen the frontal focus is inversely lessened, so that only the thinnest covers can be made use of with the highest powers. They do their best, and very good it is too, with the aid of expressly constructed ‘projection oculars, which flatten the field besides lengthening the working-distance—but this entails such diminution of light as to make accurate focusing difficult by the comparatively feeble rays of a lamp.



Negative by A. A. Adee.

FIG. 336.—LANCES OF BLOWFLY. × 14. HARTNACK, 2 INCHES.

“Assuming that the power of the objective, the strength of the illumination and the angle of the beam converged on the object are in perfect correlation, the management of the substage diaphragm becomes important. If too widely open the image on the screen lacks contrast and it is hard to get a satisfactory focus. By gradually closing the diaphragm, which ought to be of the iris pattern, a point is reached affording marked contrast. To get the right focus it does not suffice to see the object generally well defined — its color becomes a potent aid to the average achromat in order that it may exert its best actinic effect upon the sensitive plate. Remembering that the residual secondary spectrum is usually a palish green in most modern objectives, some delicate transparent detail of the object should be chosen, such as a fine bristle or beaded marking, and the micrometer adjustment be manipulated until a tinge is seen on the border line between green and rose. After this actinic focus is secured, I find it does good to still further slightly reduce the aperture of the diaphragm if the light be strong.”



Negative by Dr. H. J. Ditmers, 1893.

FIG. 337.—AMPHIPLEURA PELLUCIDA. × 1240. QUEEN, $\frac{1}{15}$TH OIL-IMMERSION.

“In photographing the interesting details of insects and vegetabe anatomy, three objectives are advisable, one of oen and-a-half or two inches focus, one of three-quarters, and a third of one-quarter. Being used without an eye-piece, preference may be given to objected corrected for the American or English tube length rather than the short continental standard, for the lens is less strained when its conjugate focus is stretched to 30 inches. To these three may be added a good one-fifth or one-sixth if an

THE PHOTOGRAPHIC TIMES.

AN ILLUSTRATED MONTHLY MAGAZINE DEVOTED TO THE ART, SCIENCE AND ADVANCEMENT OF PHOTOGRAPHY.

Issued on the fifteenth of each month.

EDITED BY WALTER E. WOODBURY, F. R. P. S.

SUBSCRIPTION RATES.

For one year, - - - -	$4 00	Three months' trial, - - -	$1 00
For six months, - - - -	2 00	Single copy, - - - -	35

On Foreign Subscriptions, $1.00 is added to pay postage.

Remit by Express Money Order, Draft, P. O. Order, or Registered Letter.

Subscriptions to THE PHOTOGRAPHIC TIMES received by all dealers in photographic materials in this and foreign countries, also by The American News Co. and all its branches.

ADVERTISING RATES WILL BE SENT ON APPLICATION.

Copy for advertisements must be received at office one week in advance of the day of publication. Advertisers receive a copy of the journal free, to certify the correctness of the insertion.

All literary contributions, correspondence, "Queries," etc., should be addressed to THE EDITOR; all advertising matter to the Publishers.

THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION,
60 and 62 East 11th Street, New York.

Businesses For Sale.

Advertisements will be inserted in this column at the rate of 25 cents per line of ten words. Display lines will be charged double. No Advertisement will be inserted for less than one dollar. Cash must in every case accompany copy, which should reach us not later than the tenth of each month.

$500. A Photograph Gallery, doing business at good prices; well equipped and elegantly furnished; large and convenient rooms; all on ground floor; very low rent. GIPPLE. HUNTINGDON, PA.

FOR SALE.—One second-hand 20 x 24 Scovill camera, double swing, focus lever, extension bed with curtain slide, bonanza holder. List $110. One 20 x 24 Beck lens. List $200. All in good condition and will sell at a bargain. Address L. M. Prince & Bro., 108 West 4th Street, Cincinnati, O.

FOR SALE.—At a bargain, one No. 5 Kodak, adapted to plates and films. Address B. M. Yates, McCredie, Mo.

FOR SALE.—The leading Studio in a Massachusetts city, 15,000, and as many more to draw from. Duplicates in 1896. Average, $40.27 per month. Rent, $13.00. Cabinets, $3.00 and $4.00. If desired, half cash, and balance, easy payments. Address C. L. Fremont, Marlboro, Mass. Box 148.

FOR SALE.—$1000 cash will buy a fine Gallery in the city of Spokane, Washington, 3500 inhabitants. Instruments from cabinet to 18 x 22. Good reasons for selling. Address "B," care Zimmerman Bros., St. Paul, Minn.

FOR SALE—Only gallery in town of 5,000. Best location in the State. Fully equipped for work to 11 x 14. Write quick if you want it.
H. F. MORLEY, Rock Hill, S. C.

Lantern Slides from drawings, photographs, or negatives. Best work at reasonable rates. Scovill & Adams Co. of N. Y.

Gallery for sale; mining town; 8,000 population; no opposition; good business year round; no winter; fine climate. For particulars write, W. O. Amsden, Grass Valley, Cal.

Employment.

ADVERTISEMENTS OF OPERATORS SEEKING SITUATIONS WILL BE INSERTED FREE OF CHARGE.

Employment Wanted.

Wanted by an up-to-date photographer (competent to take charge of a studio) a position in a thriving town, East or West. The highest reference as to character and ability will be given. Address A. M. Bertels, cor. Butler and Canal Street, Wilkesbarre, Pa.

Wanted, by a first-class operator and general skylight man of long experience. Understands all branches. Good reference given and samples sent. J. S. Reitmeyer, 25 Hudson Avenue, Green Island, Troy, N. Y.

A capable operator wishing to make a change will be open for engagement Oct. 1. Artistic in posing and lighting. Practical in carbon printing. Single and double transfer. Have had experience as manager of well-known studios—willing to make himself generally useful, or would buy interest in good paying studio. Reference given and required. Address "Carbon," care PHOTOGRAPHIC TIMES, 62 East 11th Street.

A printer of wide practical experience with the leaders is now ready to engage with a first-class man. Would not object to going out of town. References. J. Chauncey Davis, 1581 Atlantic Ave., Brooklyn, N. Y.

A first-class operator and retoucher wants a position. W. Hoesten, 349 Ninth Avenue, N. Y. City.

Situation wanted by first-class printer and toner (all processes), retoucher as well, of 18 years experience first-class reference. C. E. Pearsall, 101 Congress St., Saratoga Springs, N. Y.

Situation wanted as operator and printer. Carbon and bromide work. Address "Photographer," Lock box 85, Palmyra, N. Y.

Position in "bang up" gallery; am all-round man; or on the road for good firm; competent; references. Address G. H. Boice, Grand Rapids, Mich.

A good operator and retoucher is open for engagement; competent to take full charge of a studio. Specimens furnished on application. Address B. F. Cooke, No. 624 First Street, Lancaster, Pa.

Operator, whose posings are original, artistic, and characteristic of subject. An expert in the handling of children. Retoucher; $18. J. Walter Sarony, Gen. Del., St. Louis.

Note.—Some interesting reading matter will be found on the following pages.

GET OUT

OF THE RUT.

Don't Follow old trails
when new ones are better.

Use
"R. M. & W."
Papers

Vera
Vera Matte
(Collodion)
Victor
Victor Matte
Victor Special
(Gelatine)

and you will get

The result of sixteen years experience in practical chemical work.

The result of eleven years experience in the manufacture of Dry Plates, Bromide Paper, Transparent films, Printing-out Paper, etc., each of which was a standard.

The result of a knowledge of the progressive photographer's requirements, and the ability to meet them.

"The permanency of R. M. & W. Papers
is beyond question."

The Reichenbach, Morey & Will Co.

327 University Avenue, Rochester, N. Y.

IN ADDITION TO
French Satin Jr.
THE STANDARD BLUE PRINT PAPER

We are Manufacturing a line of

Photographic Specialties

The same careful supervision which controls the manufacture of our Blue Print Paper will be extended to these new products, of which we have ready

MILLEN'S

- NORMAL PHOTOGRAPHIC DEVELOPER
- CHROMIUM FIXING SALT
- STANDARD WHITE PASTE
- HARDENING SOLUTION
- HYDROQUINONE (*Chemically Pure*)

Send for descriptive circulars of any of the above articles

J. C. MILLEN, M. D.,
Manufacturing Chemist,
DENVER, COLORADO: *No. 1731*
Welton Street. .·. .·. U. S. A.

FOR SALE.—Three Photo Gelatine Power Presses (Faber-Schleicher), formerly belonging to the F. Gutekunst Co. Will be set up in running order and instruction given. The Albertype Co., 15 Laight Street, New York.

H. B. PUTERBAUGH, PHOTOGRAPHER AND PROCESS ENGRAVER.

JOHN CARBUTT, Esq., Wayne Junction, Pa.

Dear Sir: Sample of your "New Process Plate" at hand and tested with the MOST PLEASING RESULTS. I send herewith a small order for Strippers, and if I have as good success as I had with my first trial, I shall discard the wet plate process FOREVER, for I am disgusted with it.
Very respectfully,
(Signed) H. B. PUTERBAUGH.

RETOUCHING FOR THE TRADE—First class work at moderate prices. Address Miss ALICE WINSLOW, 1,129 N. Main street, Brockton, Mass.

LANTERN SLIDES.—If you require good ones from your negatives send to
H. H. WILLIAMS, Simeon, Va.

MORAN'S BARGAIN LIST No. 47,
NOW READY.

If you want anything in the Photographic line, it will pay you to send for it.

FREE USE OF DARK ROOM.

R. H. MORAN, 22 East 16th St., New York.
One Door West of Union Square.

SPECIAL NOTICE.

BACKGROUNDS
FOR CARBON AND
PLATINUM EFFECTS.

W. F. ASHE, Scenic Artist,
76 East 9th Street, - - New York City.

Have you anything ... to sell ...?

The American Annual of Photography for 1898

Reaches 20,000 Amateur and Professional Photographers.

Address, for Advertising Rates, to
Manager The American Annual of Photography,
60 & 62 EAST 11TH ST., N. Y.

THE ALBERTYPE COMPANY
PHOTO-GELATINE PRINTERS
15 LAIGHT ST., NEW YORK.
VIEWS MADE INTO SOUVENIRS
at short notice, from photographs or negatives.
SEND FOR SAMPLES AND EDITION PRICES.

CHAS. R. STEVENS, Pres't and Treas.
GEO. P. MACKIN, Vice-Pres't and Sec'y.

CHICAGO PHOTO STOCK CO.,
Dealers in
Standard Photographic Apparatus and Supplies,
38 E. Randolph St., Chicago, Ill.

Use "Non-Cockle" Mounting Paste.

Photographic Supplies.

Order Your Photo Goods

OF THE

NEW STOCK HOUSE

Meyer Brothers Drug Co.

Saint Louis.

WIDE AWAKE

MANUFACTURERS AND DEALERS

Will be represented in

The American Annual of Photography for 1898.

NOW IN PREPARATION.

Address:

Manager The American Annual of Photography,

60 and 62 East 11th St., N. Y.

A GREAT CONVENIENCE IN DEVELOPING DRY PLATES.

Pelletone

PYROGALLIC

ACID TABLETS,

Put up in bottles, each containing 100 2-grain (*exactly* 2 grains) tablets of

SCHERING'S

Unrivaled Pyrogallic Acid

—o—

Price per Bottle, reduced to 40 Cents.

FOR SALE BY ALL DEALERS, AND

THE SCOVILL & ADAMS CO.

KING OF

FLASH LIGHT POWDERS.

LUXO

PATENTED.

FOR SALE BY ALL DEALERS

W. P. BUCHANAN. PHILADELPHIA.

THE NEW GILSON ADJUSTABLE ALBUM,

With Adjustable Covers and Interchangeable Leaves,

Is specially made for Amateur Photographers and Photograph Collectors.

It is the only album that fits collections of all sizes, employing from 1 to 48 leaves, which may be added or taken out without disturbing others by simply loosening a silk cord.

It is equally valuable for small or large collections, and is made in all styles and sizes of leaves and bindings.

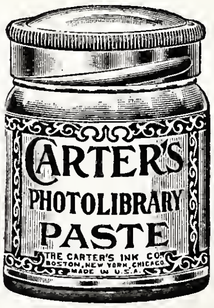
Prices for Albums complete, 80c. to $5.00

For sale by Dealers generally. Send for Descriptive Catalogue S.

Mount your Photographs with

CARTER'S

Photolibrary Paste,



A strong adhesive, quick in action and always ready for use.

Whiteness is a sign of purity. Beware of imitations which betray their impurities by their dingy color.

Carter's is pure white, bespeaking its chemical purity. If your dealer cannos supply you, a 14 oz. Jar will be sent, express prepaid, upon receipt of 25c.

THE CARTER'S INK CO.

BOSTON,
NEW YORK,
CHICAGO,
LONDON,
BRUSSELS.

Reifschneider's Eclipse Albums are the Best.

DID YOU GET OUR
BARGAIN LIST = = = No. 9

32 Pages of
LENSES,
CAMERAS,
BURNISHERS,
STANDS,
BACKGROUNDS,
Etc., Etc.

We buy and sell Photographic Apparatus.

Was mailed October 15, 1897.

RALPH J. GOLSEN,
146 State St., CHICAGO.

W. HEUERMANN,
IMPORTER OF
TRAPP & MUNCH'S
T. M. BRAND.
ALBUMEN PAPER, SALTED PAPER,
No. 23 CEDAR STREET, New York.

Cameras

The Gameland Publishing Company, Incorporated, 63 Rutgers Slip New York, N. Y., will give a large number of cameras to those persons who send to them lists containing the greatest number of words formed from the letters in the word "CAMERAS". The prizes range from $75 Folding Kodaks to pocket cameras. All competitors must send $1 with their lists for one year's subscription to GAMELAND. Contest closes February 15th, 1898. Sample copy of GAMELAND, containing full particulars of contest, Free.

Apparatus for making : : : :
FILMS
Or PICTURE RIBBONS, for moving-picture machines.

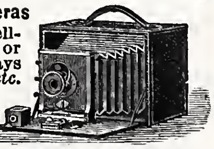
Perforators, Standard Gauge,	$100
Cameras, Hand, Spring, and Electric,	$75 and $150
Printers, Gas and Electric,	$25
Developing Trays,	$25 and $100
Complete plant,	$150

LIBERAL DISCOUNT TO TRADE.
C. FRANCIS JENKINS, 1325 F Street, N. W., Washington, D. C

ALUMINUM
SUN FLASH POWDER
(PATENTED)
WILLIAMS, BROWN & EARLE
PHOTOGRAPHIC SPECIALTIES
PHILADELPHIA
FOR SALE BY ALL DEALERS

ASK TO SEE THE NEW
W. B. & E. ART ALBUMS
NO PASTING REQUIRED
WILLIAMS, BROWN & EARLE
PHOTOGRAPHIC SPECIALTIES
PHILADELPHIA
SOLD BY ALL DEALERS

N. Y. CAMERA EXCHANGE
60% Saved on all makes of Cameras
Headquarters for Buying, Selling, and Exchanging Cameras or Lenses. Large assortment always on hand. *Developing, printing, etc.* Photo supplies of every description at *lowest prices.* ☞ *Send 2c. stamp for bargain list.* Address
N. Y. CAMERA EXCHANGE, 41 Fulton St., NEW YORK.

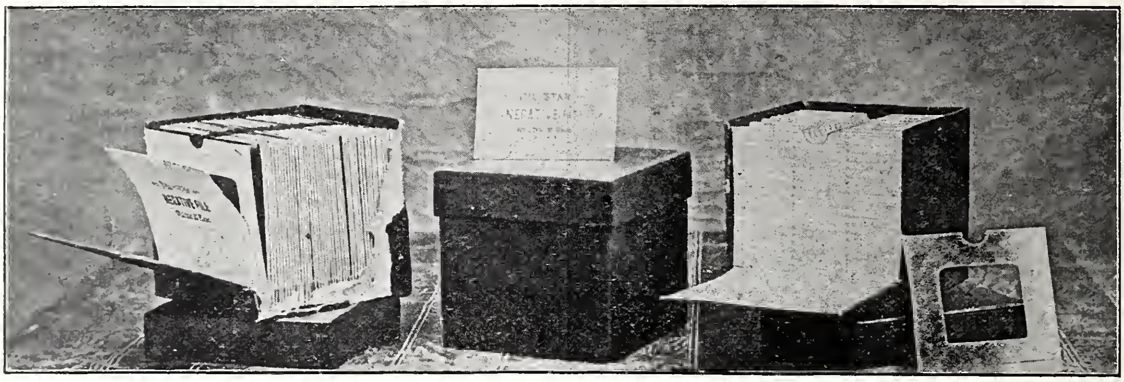


THE AMERICAN PHOTOGRAPHIC PAPER CO.,
MANUFACTURERS OF UNPREPARED
Photographic Papers
SPECIALTIES;
Raw Paper for Solar Printing, Platinotype, Bromide, Salting, Baryta Coating, rough or smooth surface, in rolls or sheets. Also high grade Drawing Paper for Architects, Buff and White, in rolls or sheets.

MANUFACTURED AT MILLS OF
HURLBUT PAPER MANUFACTURING CO., SOUTH LEE, MASS, U.S.A
OFFICES:
2304 Washington St., Boston, Mass., U.S.A.

Are You Using Hammer Plates?

PRESERVE YOUR NEGATIVES.



THE STAR NEGATIVE FILE

is of great convenience to the photographer. It holds 50 negatives (or Lantern Slides), between pasteboard mats which can be numbered for quick reference. It is also furnished with an index, with numbers corresponding to the numbers on the mats. They are made in three sizes.

Price for Lantern Slide size, 50 cents.

4 x 5 size, 60 cents. .·.·. *5 x 7 size, 85 cents.*

For sale by all the trade, and

THE SCOVILL & ADAMS COMPANY OF NEW YORK,
TRADE AGENTS,
60 & 62 EAST ELEVENTH ST., NEW YORK CITY.

THE ALBERTYPE COMPANY,

15 LAIGHT STREET, NEW YORK,

Near Canal Street, West.

Photogelatine Printing.

THE LARGEST PLANT IN AMERICA.

Specialty : : : :

Souvenirs to order of Views, Portraits, Etc.

(WRITE FOR SAMPLES AND PRICES).

Half-Tone Plates to Order.

The Brilliant Developer.

This new developer surpasses all others in **covering power** and **cheapness,** it keeps for weeks after use, and a surprising number of plates can be developed in the same solution before it is exhausted With equal exposures and equal time of development it will give as an average **three times** more **covering** than any other developer. It is a liquid developer and ready for use after being mixed with an equal quantity of a 10 per cent. solution of Carbonate of Potash. It is very clean and discolors very little even when kept some time after use.

After extensive tests, comparing it with Pyro, Ferro Oxalate, Hydrochinone, Metol Eikonogen, Amidol, etc., etc., it has been ascertained, that in using the Brilliant Developer as an average only **one third** of the time of **exposure** is necessary, compared with the exposure required when developing with the other developers, which is an enormous advantage, especially during dull weather. Thus much money, time, and work can be saved on plates, which otherwise would have been **lost** by **under exposure** or the object having **moved.**

The price is very moderate and lower than of the most developers at present in use, as the same solution can be used over and over again by adding from time to time some fresh Brilliant Developer.

The success this new developer is having in Europe is simply marvellous, especially with professional Photographers, who are as a rule, so reluctant to try new materials. It has obtained a prize at the **Berlin Exhibition for Photography,** and scores of testimonials are arriving every week.

FORMULA.

Dissolve 1 oz. of Pure Carbonate of Potash in 10 ozs. of water.
Mix 1 oz. of Brilliant Developer with 1 oz. of the above Potash solution.

If very soft negatives are required the proportion of potash solution may be increased.

FOR DEVELOPMENT OF BROMIDE PAPER,

for which the Brilliant Developer is also particularly suitable the following proportions are recommended:

½ oz. of Brilliant Developer.
½ " " Potash Solution.
1 " " Water.

This will develop a great number of Prints. For softer results more water must be added.

THE BARMEN DRY PLATES MFY.

TRADE AGENTS:
THE SCOVILL & ADAMS CO.
OF NEW YORK,
60 and 62 East Eleventh Street, NEW YORK.

BRUNE & HÖFINGHOFF,
Barmen, Germany.

Use the **Hammer** = =

Dry Plates

ABSOLUTELY

Uniform and Clean.

Incomparable

FOR THE STUDIO,

FOR THE HAND CAMERA.

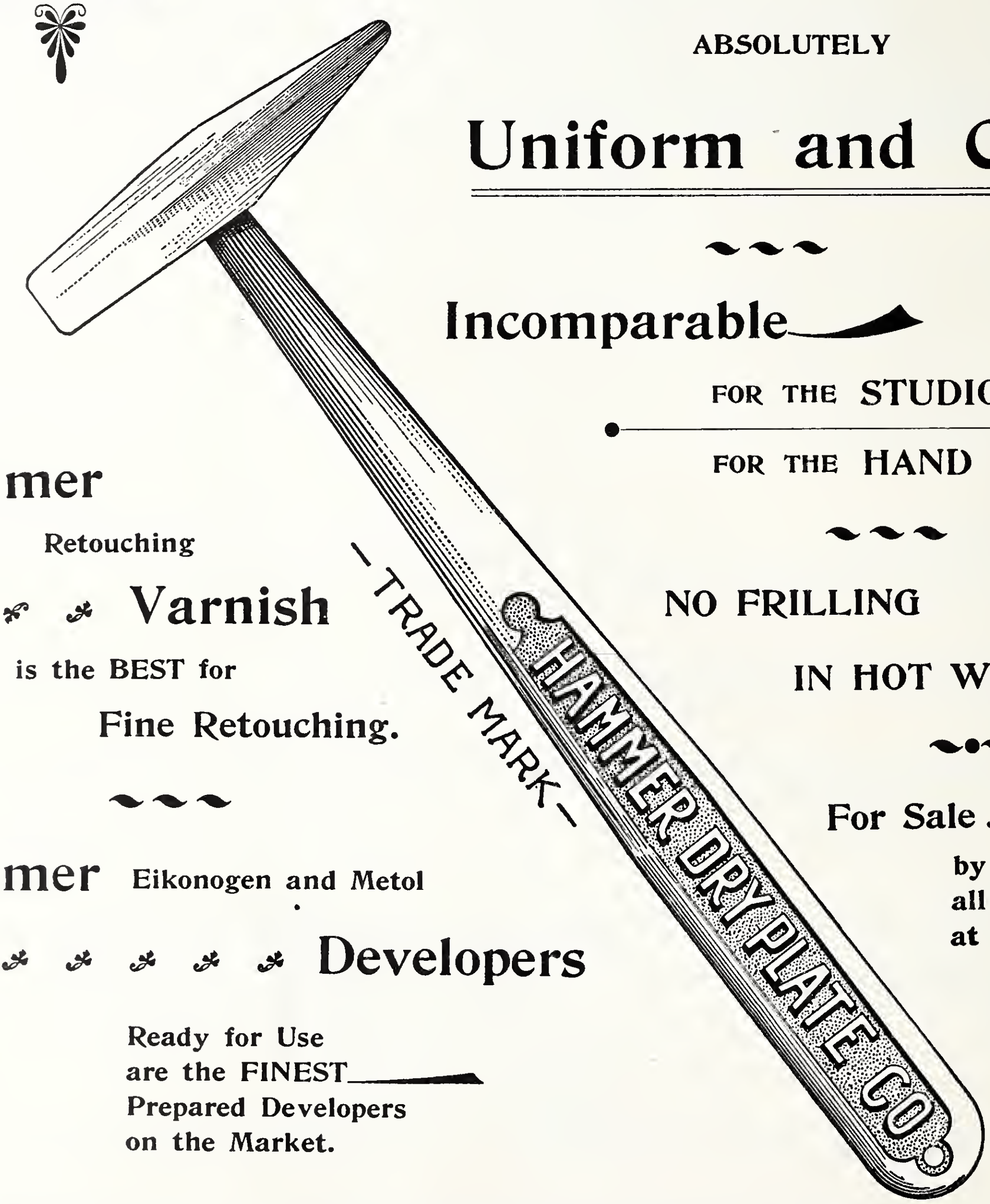
NO FRILLING

IN HOT WEATHER.

For Sale ....
by
all Dealers
at
Popular
Prices.

Hammer
Retouching
Varnish
is the BEST for
Fine Retouching.

Hammer Eikonogen and Metol
Developers
Ready for Use
are the FINEST
Prepared Developers
on the Market.



Send for Hammer's "Little Book" a short talk on negative making, mailed free to any address.

MANUFACTURED BY

Hammer Dry Plate Co.,

ST. LOUIS, MO.

THE SCOVILL & ADAMS CO. OF N. Y., EASTERN TRADE AGENTS.

MINOTT M. GOVAN,
DEALER IN PHOTOGRAPHIC SUPPLIES,
No. 5 Clinton Place, New York.
(Three doors from Broadway.)
FULLY ILLUSTRATED Catalogue and Price List mailed on application. Lenses and Outfits a specialty.

DIETZ RUBY LAMP

For Dark-Room Use.

New Construction
Don't Leak Light.
1½x3x6½ ins.
NO SMOKE.

Sold by Dealers.
We send you one, prepaid, for 75 CENTS.
Circular free.

R. E. DIETZ CO., N. Y.

"Modern and Progressive."

STEPHEN B. BUTTS.
JOHN F. ADAMS.

BUTTS & ADAMS,

TRADE B & A MARK

Photographic Supplies,

457 and 459 Washington Street,
BUFFALO, N. Y.

Something New!!

P. P. P. ENLARGEMENTS FOR PHOTOGRAPHERS.

SEND FOR PRICE LIST NOW.

Headquarters for Portraits in Crayon, Water Color, India Ink, and Pastel.

STONE BROS., SUCCESSORS TO N. L. STONE & SON,
56, 58, & 60 Market St., Pottsdam, N. Y.

ACETYLENE GAS

FOR **DOMESTIC ILLUMINATION**

is the latest and best form of lighting. Our

Patented Automatic Generators

make a private gas plant now practicable and economical.

Write to Department "H" for booklets and circulars which tell all about them and their wonderful product.

J. B. COLT & CO.,

MANUFACTURERS OF

Apparatus for the Production and Projection of Light,

STEREOPTICONS,

LANTERN SLIDES, Etc.

115-117 Nassau Street, - - - - - - New York.
189 La Sulle Street, - - - - - - - Chicago.
131 Post Street, - - - - - - San Francisco.
Erie Co. Bank Building, - - - - - Buffalo.

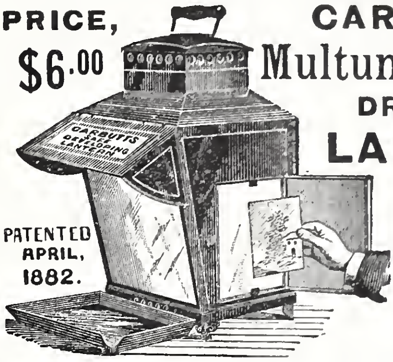
Exhibition Rooms,
New Zealand Building, Broadway & 37th St., N. Y. City.

A Rare Opportunity.

FOR SALE. A well established photo-engraving business: one of the leading houses in New York City. Present owners retiring from business. Responsible parties only need apply, in the first instance, to the Editor of this magazine.

PRICE, $6.00

CARBUTT'S
Multum-in-Parvo
DRY PLATE
LANTERN.



CARBUTT'S DRY PLATE DEVELOPING LANTERN

PATENTED APRIL, 1882.

Lantern arranged for developing, and, after fixing, examining negatives and positives by opal light.

The **Best** and **Cheapest** for all Dark-Room Work.

Manufactured by
JOHN CARBUTT
Wayne Junction,
Philadelphia.

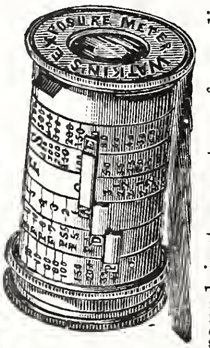
TO POSTER COLLECTORS.

Copies of this poster Size 2 x 3 feet will be sent free

THE PHOTOGRAPHIC TIMES.
An Illustrated Monthly Magazine of Photography.
Edited by Walter E. Woodbury.
SUBSCRIPTIONS RECEIVED HERE

On receipt of 50 cents
THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION,
60 and 62 East 11th St., N. Y.

AVOID FAILURES IN MAKING NEGATIVES BY USING THE WATKINS EXPOSURE METERS.



THE NEW STANDARD (1895.) $5.00.

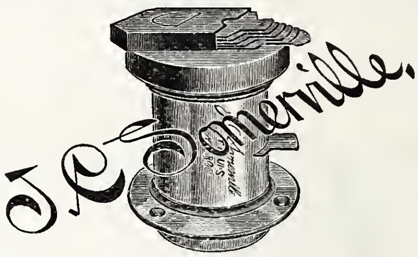
SIMPLER than the old standard, having one less pointer. Provided with the subject and enlarging scales, which do not obtrude themselves when not wanted. The only instrument made which is *absolutely complete* for all problems, especially copying, enlarging and contact printing without reference to tables. It supersedes the old enlarging pattern at a smaller cost. The best all round instrument, as for ordinary work it is quite as simple in use as the Watch or Junior patterns, though not made so light or convenient in shape; quite a feather-weight when made in aluminum. Provided with a pendulum, which is invaluable for timing the actinometer and camera exposures. Exposures under one second are now marked in vulgar fractions, on a distinct part of the scale to the seconds scale.

INSTRUCTIONS (for all ordinary subjects).—*Set pointer P to plate speed, D to the diaphragm, A to the light value, and E will indicate the exposure.*

For Sale by THE SCOVILL & ADAMS CO. OF N. Y., 60 & 62 E. 11th St.

---

411 and 413 Washington Avenue,

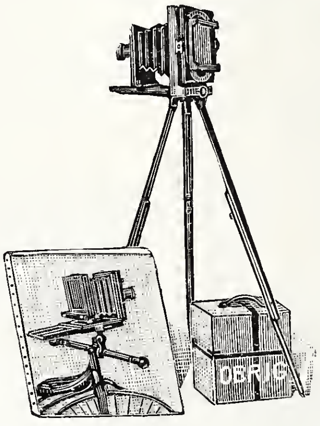


ST. LOUIS, MO.

Send for Our Lens Pamphlet and Bargain List.

OUR FACILITIES

Were NEVER BETTER



For turning out good printing than they are at present. We are known for our good, even and careful work in this respect. With the word "**Printing**" we mean to cover not only **Albumen** and **Aristo** contact work, but **Platinotype** and **Blue Prints** as well. Bromide Enlargements are a specialty with us, and developing both plates and films receive our careful attention and are done at factory prices. Our little "**Booklet of Good Things**" contains prices for all this work, and can be had with our new **Bargain List** (just out) for a one cent stamp.

O. C. Co.'s well known "Special" Blue Paper, 25 cents per yard (cut to any size and mailed free).

OBRIG CAMERA CO.,
165-167 BROADWAY, NEW YORK,
NEAR CORTLANDT STREET.
TELEPHONE No. 4704 CORTLANDT ST.

We have a new KODAK and KODET booklet ready for distribution.

YOU WILL LAUGH

WHEN YOU SEE THE HUMOROUS ILLUSTRATIONS IN

Photographic Amusements,

By WALTER E. WOODBURY (Editor Photographic Times.)

BUT You can find out how to make them too. All sorts of the grotesque effects with the camera, including spirit photographs, doubles, caricature portraits, etc., etc. *Over 100 Illustrations.* . . . . .

Price, in paper covers, $1.00; cloth, $1.50.

For sale by all Photographic Dealers, or by

The Scovill & Adams Company of New York,
NEW YORK CITY.

STEINBACH & CO., MALMEDY, GERMANY

Manufacturers of

Photographic Papers

For Solar and Bromide Enlargements, Salting, Albumenizing, and Baryta Coating;

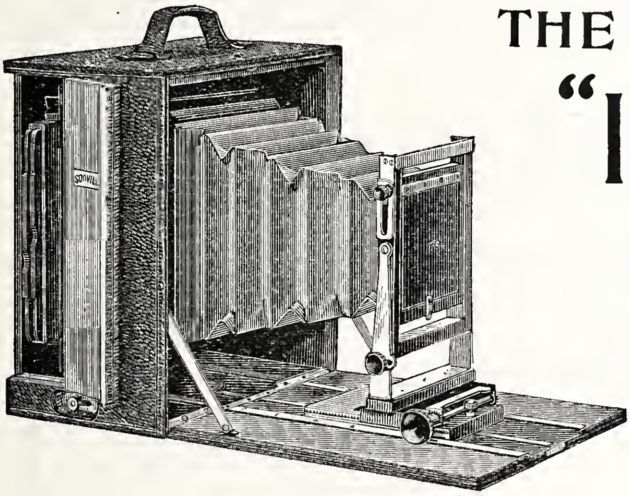
UNEXCELLED FOR BLACK AND BLUE PRINTING,

BARYTA PAPERS, GLOSSY AND MATT SURFACE.

SEND FOR SAMPLES AND ESTIMATES.

NEW YORK OFFICE:
621 BROADWAY.

PAUL PUTTMANN,
Sole Agent for the U. S. and Canada.



THE IMPROVED

"IRVING-CLAY"

CAMERA

THIS "fin de siècle" Camera, as it has been called, marks the highest attainment in camera manufacture *at the end of this century*. It is made at the works of the well-known American Optical Company, which in itself is a guarantee of perfection in durability of construction and fineness of finish.

A preliminary camera of this name was introduced some weeks ago, and the entire stock was quickly sold. The **Improved Irving=Clay** fully justifies its name as it is a much improved form of the first camera of this class introduced. It contains two double holders instead of one, and the entire construction of the camera has been improved, with many useful and valuable features added.

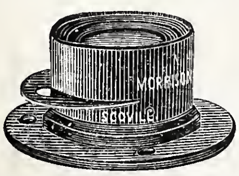
The Improved Irving-Clay combines the best features of the well-known "Henry Clay" and "Irving" Cameras, as its name indicates, and is the only hand and tripod folding camera with reversible self-adjusting spring back, and other features characteristic of these two cameras. It is made of thin spruce, highly polished, and is therefore extremely light and portable. It is covered with the best grade of leather, and possesses all the movements—swing back, front focus, shifting front and movable front boards—and conveniences which an "up-to-date" camera should have.

PRICE:		
	6½ x 8½, with *two* Double Irving-Clay Plate Holders,	**$45.00**
	8 x 10, " " ' ' " "	**50.00**

The Scovill & Adams Company of New York,

60 and 62 EAST 11th STREET, NEW YORK.

MORRISON WIDE-ANGLE VIEW LENSES.

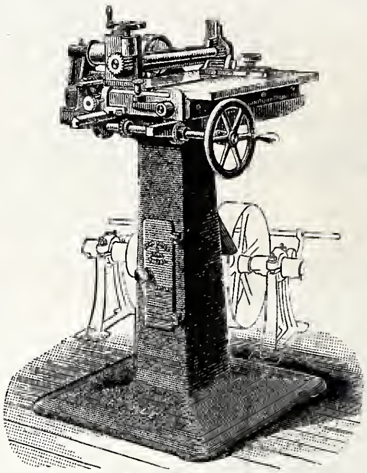


These lenses are absolutely rectilinear; they embrace an angle of 90 degrees, and are the most rapid *wide-angle* lenses made.

No.	Diameter of Lens.	Size of Plate.	Equivalent Focus.		Price.	
0	..1 inch	...3¼x4¼ inch	... 2½ inch	...each,	$20.00	These 5 sizes will fit into 1 flange.
2	..1 "	...4 x 5 '	... 3½ "	... "	25.00	
3	..1 "	...4¼x 6½ "	... 4½ "	... "	25.00	
4	..1 "	...5 x 8 "	... 5¼ "	... "	25.00	
5	..1 "	...6½x 8½ "	.. 6½ "	... "	25.00	
6	..1 "	...8 x10 "	... 8 "	... "	30.00	
7	..1¼ "	...11x14 "	...10½ "	... "	40.00	These 2 sizes will fit into 1 flange.
8	..1¼ "	...14x17 "	...14 "	... "	50.00	

☞ Nos. 1 to 6 are all made in matched pairs for stereoscopic work. The shorter-focused lenses are especially adapted for street and other views in confined situations. For general purposes, a pair of No. 5 lenses will be found most useful.

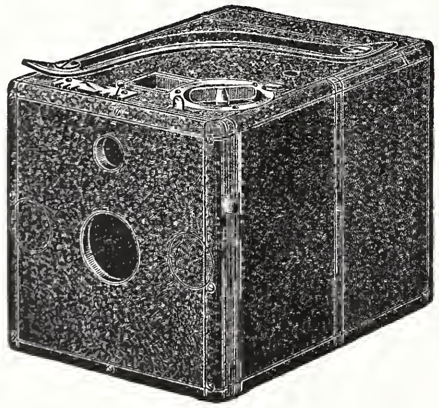
FOR SALE BY ALL DEALERS.



The Straight Line Router...

has never been equaled as an all-around Routing machine, suitable for all kinds of work. No other Router has quite the touch of the Straight Line. We have recently made a material reduction in the price of this sterling machine, and at the figure at which we offer it, it is a genuine bargain.

JOHN ROYLE & SONS,
Paterson, N. J., U. S. A.



The Hawk-Eye, Jr.

for the Professional as well as the Amateur.

Price, $8.

Measures but 4¼ x 4¾ x 6 inches, has a square finder, automatic time register, improved time and instantaneous shutter, with different speeds ; loads in broad daylight and can be used with film for 12 or 25 ex. or glass plates.

Send for our catalogue of New Cameras.

THE BLAIR CAMERA CO., Manufacturers, 22 Randolph Street, Boston.

THE SPC

ACID FIXING AND HARDENING COMPOUND

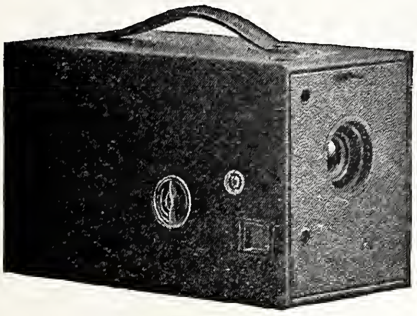
For NEGATIVES, TRANSPARENCIES, LANTERN-SLIDES and BROMIDE PAPER.

Destroys all developing fog and yields peculiarly beautiful and permanent results.

This solution can be used repeatedly so long as it fixes. It can also be used as a reducer of over density by a long continued treatment.

Price, in one lb. packages, only 25 cts. | **In one-half lb. packages, only 15 cts.**

FOR SALE BY ALL DEALERS.



SUNART TRIPODS.

Send 2 cent stamp for Illustrated Catalogue.

All Stock Dealers handle Sunart Cameras.

"SO SIMPLE A CHILD CAN USE THEM."

THE LATEST.

SUNART JUNIOR, 3 1-2 x 3 1-2.

: : : $5.00 : : :

30 Styles, from $5.00 up to $125.00.

Developing and Printing Outfits, Etc.

Sunart Junior, No. 1, 3 1-4 x 4 1-4
The Sunart Magazine Camera : :
Folding and Cycle Cameras : : :

SUNART PHOTO CO.,
23 Aqueduct Street, Rochester, N. Y., U. S. A.

Have You

Secured

Your

GOERZ

ANASTIGMATIC

LENS

Yet?

Be sure

You get

One

Made by

Goerz.

(Patented.)

"IN A NEW DRESS."

FOR '97.

Handsomely embossed.

Reflecting surfaces so protected that they cannot become smoked or tarnished.

Rigid bracket. Will not jar or blow out.

Fully protected by patents which will be maintained.

THE BRIDGEPORT BRASS CO.,
BRIDGEPORT, CONN.
19 Murray Street, New York; 17 North 7th Street,
Philadelphia; 85-87 Pearl Street, Boston.

THE SCOVILL MAGNESIUM COMPOUND

IS ENTIRELY FREE FROM POISONOUS AND EXPLOSIVE INGREDIENTS.

In order to demonstrate this, quantities have been eaten at various times. It has often been pounded in a mortar to show that it does not explode.

FOR SALE BY ALL DEALERS.

Standard Papers for Photographic Processes.

B. F. K. RIVES

FOR ALBUMENIZING, ARISTOTYPE (GELATINE AND COLLODION), BROMIDE, SOLAR
CHEMICALLY PURE PHOTO BLOTTING PAPER.

NEW YORK OFFICE:
621 Broadway (Cable Building).

BLANCHET FRÈRES & KLÉBER,
RIVES—ISÈRE. (FRANCE.)

THINK of something new and protect the invention with a GOOD patent. That's the way others have acquired wealth. Costs nothing to try. Names of inventors wanted. Send for reliable tips to inventors, to **Inventive Age Patent Bureau**, (Pub's "Inventive Age.") Washington, D.C.

KOBE, JAPAN, June 30th, 1897.

THE PHOTOGRAPHIC TIMES PUB. CO., NEW YORK:

Gentlemen: Your post card and THE TIMES for April, May, and June have been received. Your paper is very well gotten up and deserves to have a very wide circulation. It carries an artistic atmosphere with it. Personally I don't remember ever having had such delight out of $5, and I have only had three numbers so far.

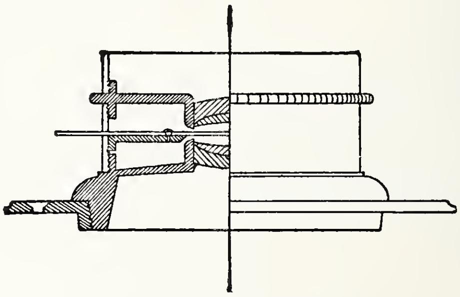
Present my compliments to the staff of the paper, and believe me, very truly yours,

F. B. ABENHEIM.

I want to take this opportunity to compliment you on *The Photographic Times.* All I can say is that I have travelled in many countries, and have always looked up the photographic publications of those different countries, but have never yet found any whose reading material and general "get up" would *in any way* justify my adding my name to their subscription list after having once been a subscriber to *The Photographic Times.*—J. E. H. POST.

The Unrivaled STEINHEIL LENSES.

SERIES IV. **Rapid Wide-Angle,** specially designed for landscape work and architecture, but can also be advantageously used for flash-light interiors and copying.



SERIES V.

Extreme Wide-Angle, for architecture and interiors, and for very high, broad objects taken from short distances.

The Scovill & Adams Co. of N. Y.,
60 and 62 EAST 11th STREET,
NEW YORK, N. Y.

Finest Quality and Absolute Uniformity are the marked features of "PERFECTO" PAPER.

We do not believe in blow or bluster, neither do we claim that we have the only paper in the market. We do say, however, that if "PERFECTO" has an enemy in the world, we have yet to learn it. **What other paper firm can say this?**

"PERFECTO" PAPER SELLS ON ITS MERITS.

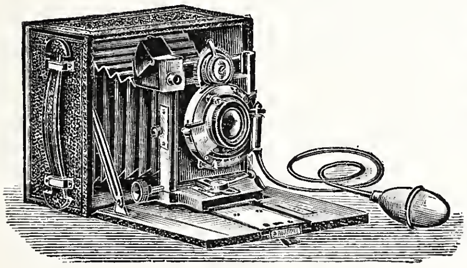
THE "PERFECTO" ARISTOTYPE PAPER COMPANY
79 CORTLANDT STREET, NEW YORK.

Gundlach Optical Co.

ROCHESTER, N. Y.,

MANUFACTURERS OF

Photographic Apparatus....



The only concern in the United States turning out a complete camera, lens, and shutter, all of their own manufacture . . . .

OUR LENSES ARE WORLD RENOWNED.

....OUR SHUTTERS LEAD....

OUR CAMERAS ARE UNSURPASSED IN WORKMANSHIP OR FINISH.

Send for Catalogue.

Gundlach Optical Company,
753 to 765 SOUTH CLINTON STREET,
Rochester, N. Y.

ACTIEN-GESELLSCHAFT FÜR ANILIN-FABRIKATION
BERLIN
GERMANY
GERMANY
United States of America Patent No. 475372.
United States of America Patent No. 415312.
Dr. M. Andresen's EIKONOGEN
16 oz.
The right of utilizing Eikonogen for photography is protected by Patent in all countries. It is conceded to the buyer of this package and expires on the contents having been used
GESETZLICH GESCHÜTZT

Actien-Gesellschaft für Anilin Fabrikation,
BERLIN.

DEVELOPERS:

Eikonogen, Rodinal, Amidol.

Sold by all Dealers.

Ask your Dealer for Formulae and Samples.

CLEMONS' NEW MATT-SURFACE PAPER.

SOMETHING NEW UNDER THE SUN—A REVOLUTION IN THE ART OF MANUFACTURING.

After many years of scientific research a preparation for the salting of plain photographic paper has been discovered, by which method the finest printing results are obtainable. The advantages are apparent to all.

I.—Constant use will not discolor the silver bath.
II.—Will produce the finest detail in printing.
III.—Any desired tone may be obtained from sepia to jet-black with less gold than ever before.
IV.—The "*New Matt-Surface*" paper when sensitized will keep fresh for a long time if properly stored.
V.—The price has not been advanced.

For sale by

THE SCOVILL & ADAMS COMPANY of N. Y.,

Sample Sheets, by mail, 10 cents each. **60 and 62 East 11th St., New York.**

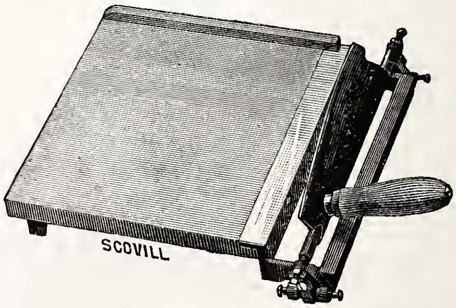
THE SCOVILL REVOLVING TRIMMER.

Has the many advantages, which its name implies, as follows:—

It cuts the paper for the print without removing it from the board or sliding it thereon.

The knife is always in position and sharp, being self-sharpened by the motion which the revolution gives.

It is very light and attractive-looking and is perfectly suited to the uses of both professional and amateur photographers.



Price (Size of knife ten inches.) Only . . . $4 00.

FOR SALE BY ALL DEALERS IN PHOTOGRAPHIC MATERIALS AND

THE SCOVILL & ADAMS CO. OF N. Y., Trade Agents.

The Triplex Shutter,

the old reliable, still more than holds its own as the shutter finally fixed upon for all-round work, when the cheap and inferior articles preceding it are discarded.

What are its advantages?

It is optically correct, gives good illumination, and has a real range of speed from time to one one-hundredth of a second.
See our Circulur on these points.

PRICES $14.00 UP.

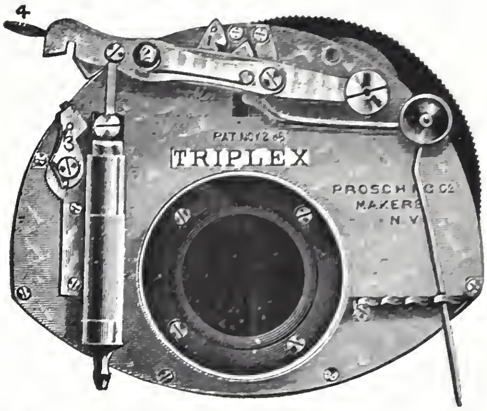
ATHLETE shutter for rapid Stereoscopic Triplex.
Detective Triplex for detective cameras.

FLASH LAMPS.

Lightning Storage Lamp,	$4 50
Professional Storage Lamp,	9 00

Circulars on Application.

PROSCH MFG. CO.,
389 BROOME ST., NEW YORK.

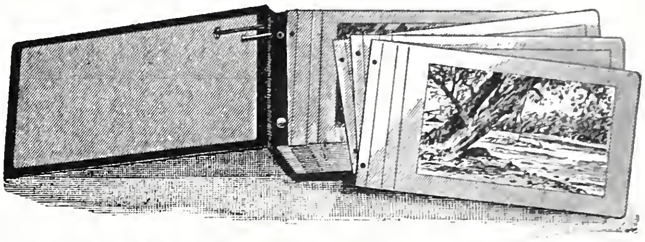


THE REGENT ALBUM.--INTERCHANGEABLE LEAVES.

The Regent Album combines neatness with durability.

The patent interchangeable feature is constructed in such a manner as to allow the leaves to be readily removed and replaced with little or no trouble and in the twinkling of a moment.

The leaves of The Regent Album lie absolutely flat and are perfectly rigid in the back.



PRICE LIST.

Each Album Containing 25 Leaves.

No.	Size	Price	Extra Leaves, White or Gray, per doz.
No. 1—	6 x 7	$1 25	$0 35
No. 2—	7 x 10	1 50	45
No. 3—	10 x 12	2 00	75
No. 4-	11 x 14	2 50	1 00

Leaves for Squeegee Photographs.

No.	Size	per doz.,
No. 1—	6 x 7	$0 50
No. 2—	7 x 10	70
No. 3—	10 x 12	1 25
No. 4—	11 x 14	1 55

The Regent Albums are bound in full cloth, handsomely embossed, finished with gilt title, and enclosed in a neat box.

THE LEAVES AND COVERS ARE ROUND CORNERED.

THEY ARE MANUFACTURED AND PATENTED BY FELIX REIFSCHNEIDER.
FOR SALE BY ALL DEALERS AND THE TRADE AGENTS,
THE SCOVILL & ADAMS CO. OF N. Y., - - - - 60 and 62 East 11th St., New York.

DO YOU MAKE

FLASH LIGHT PICTURES?

IF SO YOU MUST KNOW

BLITZ PULVER

The Standard Flash Light Powder in the United States.

60 cents per package.

For Igniting Blitz Pulver use McCollin's Igniter, - - Price $1.50

For Interiors, where quickness is not needed, use Hemperley's Magazine Flash Lamp for Magnesium Powder only, Price $2.75

For particulars of the above, send for our circulars.
Send 25 cents for a complete book on Photography, or a copy of *American Journal of Photography.*

THOS. H. McCOLLIN & CO.,
Photo Specialists,
1030 Arch St., PHILADELPHIA.

"NON-COCKLE,"

FOR MOUNTING PRINTS.

GUARANTEED NOT TO COCKLE.

40 Cents per Bottle.

For Sale by all Dealers in Photographic Goods.

H. A. Hyatt

MANUFACTURER AND DEALER IN

Photographic Supplies,

TRADE AGENT FOR

Peck's Pneumatic Retoucher,
Hyatt's Stamp Portraits,
Rival Lenses,
Magic Vignetter,
Dixie Vignetter,
Hazenstab's Publications.

Nos. 410 and 412 NORTH BROADWAY,

Saint Louis.

To my Friends and Patrons:

It gives me pleasure to announce that I have purchased the entire stock, fixtures, and good will of the J. C. Somerville Photo Supply Co. of this City, and that I have removed my stock from our old building on Eighth and Locust Streets to the spacious quarters of the retired firm, 410 and 412 North Broadway, where I shall be pleased to receive my friends.

By this transfer I have acquired the largest and best equiped plant west of Philadelphia, for the Embossing and Printing of Photographic Mounts, and we are prepared to do all classes of this work promptly and in the best possible manner.

Your correspondence and orders are respectfully solicited as in the past, for which we thank you heartily.

Yours very truly,

H. A. HYATT.

JONESBORO, TENN., May 4, 1897.

MESSRS. ALLEN BROS., DETROIT, MICH.

GENTLEMEN:—When I returned the 5 B Suter Lens, keeping the 3 A, I promised to let you know what I thought of the Suter Lens.

Well, I can safely say it is the best lens I ever owned, and, as I wrote you before, I had used fourteen different lenses and some of them were considered the best made, and I thought them pretty good till I tried the ones you sent me, and found so much difference that I am sorry I did not buy a Suter long ago. If I had, would have saved dollars in material, saying nothing about the trouble and disappointments that I have had with them. I have used the 3 A Lens for various kinds of work, in and out of doors, and every time I have gotten good results. For the past two weeks I have been making Views for a Society that is getting up pictures of all the old places of historic note about here, and have not yet failed to get a good picture, and if I had used other lenses I have, I am confident I would have failed on some of them, for some of the views were very difficult objects to photograph.

If there is anything you can get out of this that will be of any use to you, in the way of praise or recommendation to others in regard to the Suter Lens, you are welcome to use it; cut it down and pick out what you want, and if there is anyone you wish to refer to me for testimony, will gladly answer them. I am no optician, but think I know when a lens does the work as it should.

Yours very respectfully,

O. L. HENSLEY.

BARGAINS ! !

SEND TO

The Scovill & Adams Co. of New York,

60 & 62 E. Eleventh St., New York,

. . . FOR PRICES OF THE . . .

High Quality American Optical Co's VIEW CAMERAS,

Which they are offering at half price.

PHOTOGRAPHIC·MATERIALS·AND·SUPPLIES·
W·C·CULLEN
No. 61·WILLIAM·ST·NEW·YORK

SPECIAL NOTICE.

P. P. P.

PAGET PRIZE PLATES for Lantern Slides.

UNEXCELLED FOR QUALITY AND BRILLIANCY OF TONE.

HIGHLY SPOKEN OF BY THE PRIZE WINNERS.

Read what they say:

New York Camera Club,
Mr. W. C. Cullen : New York, March 30, 1896.

Dear Sir :—In answer to your inquiry, would say, I consider the Paget Lantern Slide Plate as without a rival. It is the only plate within my knowledge on which a variety of pleasing tones, running through the blacks, browns, purples and reds, can be produced at will, by *development* alone. Yours truly,

Wm. A. Fraser.

Society of Amateur Photographers of N. Y.,
March 26, 1896.

Mr. W. C. Cullen :

Dear Sir :—The Paget Lantern Slide Plates are superior to anything I have used. The majority of my prize slides were made with them.

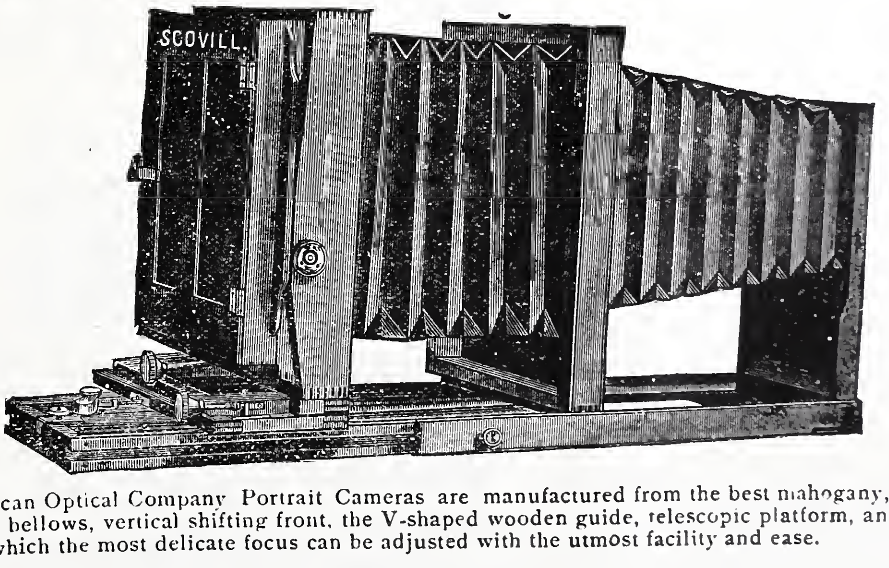
Very truly,

W. B. Post.

W. C. CULLEN, Sole Agent for U. S.,
61 WILLIAM STREET, NEW YORK.

THE AMERICAN OPTICAL COMPANY'S

UNRIVALED PORTRAIT CAMERAS.



The American Optical Company Portrait Cameras are manufactured from the best mahogany, French polished, and have double bellows, vertical shifting front, the V-shaped wooden guide, telescopic platform, and Lever Focusing Attachment, by which the most delicate focus can be adjusted with the utmost facility and ease.

No.	Size.		With Double Swing-back.
5....	8x10 ins.,	with platform 30 in. long..................	$38 00
6....	10x12 "	" " 36 "	48 00
7....	11x14 "	extension " 48 " and vertical shifting front......	64 00
8....	12x15 "	" " 48 " do	72 00
9....	14x17 "	" " 60 " do	76 00
10....	16x20 "	" " 65 " do	88 00

No.	Size.		With Double Swing-back.
11 ...	17x20 ins.,	extension platform 65 in. long and vertical shifting front ..	$90 00
12....	18x22 "	" " 70 " do	100 00
13....	20x24 "	" " 72 " do	110 00
14....	22x27 "	" " 72 " do	130 00
15....	25x30 "	" " 90 " do	170 00

(Taken on a Carbutt Orthochromatic Plate,
By Alois Beer, Photographer to Emperor of Austria.)

To obtain Artistic Results,
as much care must be used in the selection of the Plates or Films as the Camera.

CARBUTT'S PLATES AND FILMS Give Universal Satisfaction.

Also J. C. DEVELOPING TABLOIDS,
Put up in 3 sizes; Price, 25c., 40c, 75c.

If you intend competing for prizes, let us assist you in winning by the aid of our Plates, Films and Developer.

STANDARD

FOR

TWENTY YEARS.

FOR

Economy, Simplicity and Perfection in Development,

USE

CARBUTT'S J. C. TABLOIDS

FOR

SNAP AND SHORT EXPOSURES.

Crush and dissolve 2 J. and 2 C. in 3 oz. water (for a Carbutt B, time exposure, use 4 oz. water), filter through absorbent cotton, flow over plate, note how many seconds it takes for image to show (usually about 30 to 40 seconds), multiply this time by 6, and at the end of that time wash plate and fix in usual fixing bath, 1 oz. Hyposulphite of Soda and 4 oz. of water, wash for half hour, then dry.

PRICES:
25c., 40c. and 75c. Per Box.

FOR SALE BY ALL DEALERS

CARBUTT

SEND FOR CIRCULARS

FILMS

(CUT SIZES)

PLAIN and
ORTHOCHROMATIC

EUREKA RIBBON FILM
(NEGATIVE AND POSITIVE)
FOR
Chronophotographic Cameras

Perforated to Edison Gauge, and furnished in rolls of one piece, from 75 feet to 450 feet.

$3.75 per Roll 75 feet, Unperforated
$4.50 per Roll 75 feet, Perforated

SPECIALTIES:

Color Screens
Sizes 2¼x2¼ and 3¼x3¼.

Color Screens
For Photochromic Process.
Sets only. Sizes 2¼ x 2¼ and 3¼ x 3¼.

Multum-in-Parvo Lantern

Lantern Slide Mats

Lantern Slide Binders

Thin Crystal Cover Glass.

Developers.

PLATES

- ECLIPSE
- ECLIPSE JUNIOR
- Orthochromatic 23 x 27
- D. T. NON-HALATION
- B 16
- X-RAY PLATES
- Transparency Plates (Plain or on Ground Glass)
- LANTERN PLATES
- STRIPPING PLATES
- HALF-TONE PROCESS

JOHN CARBUTT, KEYSTONE DRY PLATE AND FILM WORKS, **WAYNE JUNCTION, PHILADELPHIA.**

"Some Mounting Paste, please"
says Inexperienced, and gets what the salesman pleases.

"Some ***HIGGINS' PHOTO MOUNTER,"***

says Experienced, and gets what pleases **him.** The difference is in the articles, and the moral is—if you want a **good thing** ask for it.

HIGGINS' PHOTO MOUNTER is a beautiful, pure, white adhesive, finely scented. A perfect homogeneous solution in a soft, pasty form, from which the water never separates, as in the common starch or flour pastes. Its beautiful, soft, unctuous consistency, and its wonderful smooth and easy spreading qualities (non fluid at rest but fluid under the movements of the brush) are possessed by no other adhesive, and are of the greatest importance in perfect and easy mounting. Does not strike through nor warp, adheres instantly and powerfully, dries quickly and prevents curling off at the edges. Guaranteed never to change or deteriorate. Unequaled for mounting photographs, textile samples, scrap-books, tissue work, and general use as a substitute for mucilage.

REFUSE ALL IMITATIONS.

FOR SALE BY ALL PHOTO SUPPLY HOUSES.

A 3-ounce jar, prepaid by mail, for thirty cents, or descriptive circulars for nothing, from

CHAS. M. HIGGINS & CO., Sole Manufacturers,
London Office, 106 Charing Cross Road. 168-172 Eighth St., Brooklyn, N. Y., U. S. A.

PHOTOGRAPHIC GOODS

OF EVERY DESCRIPTION.

SWEET, WALLACH & CO.

215-221 WABASH AVENUE,

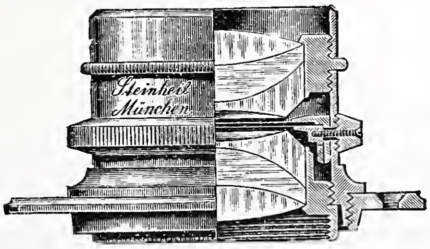
CHICAGO.

Largest and Best Assorted Stock in the World

== The Latest ==

Steinheil Lens.

Orthostigmat. F 6 8/10. Angle 85°.



Steinheil's latest production is a **Universal** Lens, combining, in a degree hitherto not thought possible, the qualities of the most rapid lenses used for

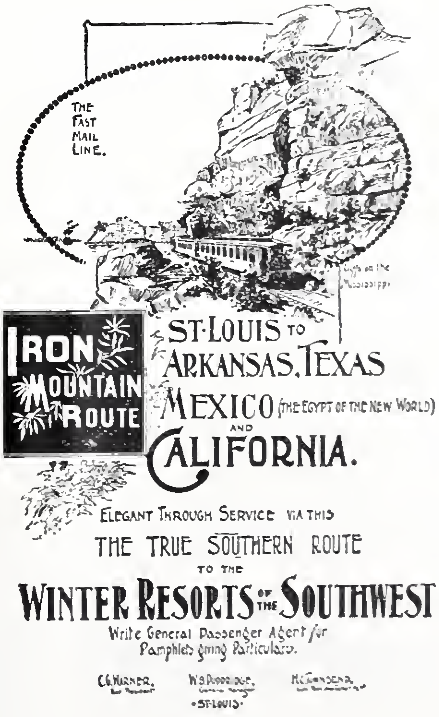
Instantaneous Work, Portraits, Etc.,

with those of the Wide Angle variety, used for

Landscapes, Interiors, and Copying.

Do not fail to give this truly wonderful lens a trial before purchasing any other.

H. G. RAMSPERGER & CO.,
SOLE AGENTS,
180 PEARL STREET, NEW YORK CITY.



IRON MOUNTAIN ROUTE

ST. LOUIS TO
ARKANSAS, TEXAS
MEXICO (THE EGYPT OF THE NEW WORLD)
AND
CALIFORNIA.

ELEGANT THROUGH SERVICE VIA THIS
THE TRUE SOUTHERN ROUTE
TO THE
WINTER RESORTS OF THE SOUTHWEST

Write General Passenger Agent for
Pamphlets giving Particulars.

C. G. WARNER. W. B. DODDRIDGE, H. C. TOWNSEND.
General Manager
ST. LOUIS.

WUESTNER'S
EAGLE DRY PLATE CO.

Our Plates Commence with Emulsion No. 5000 and are made in three grades of speed:

X Slow.
X X Medium.
X X X Quickest Plate Made.

Wuestner's CYCLONES (White Label, XXX)

For snap-shot and quick studio work. They are the quickest, the cleanest, and most brilliant plates in the market, and have more latitude than any known brand.

Wuestner's JERSEY BEAUTIES (Green Label, XX)

For general use. They are unexcelled for viewing, and are used by seven-eighths of the view photographers throughout the country.

As a guide to compare the speed between all known American and European Plates: At the test made by Watkins' Sensitometer, in England, **May, 1896**, our Cyclone XXX and Orthochromatic XXX Plates showed the highest test, number 150, while the European brands only reached the 120 mark.

Our plates fix and print in half the time that others require. No blistering or frilling with any of our brands of plates. Try them once, compare discount and plates and you will use no others.

WUESTNER'S EAGLE DRY PLATE CO.

Jackson Place, JERSEY CITY, N. J.

S. P. C. MONOGRAM

On a bottle of chemicals is a guarantee of excellence.

Insist on having the "S. P. C." brand.

For Sale by all the Trade.

ARE YOU USING

The "World" Special Photo Finish . . . **Blotting Paper?**

It is chemically pure, and will not lint.

ASK YOUR DEALER FOR IT. TRY IT.

Every sheet of the genuine bears embossed water mark of "World" Blotting.

The Scovill & Adams Co. of New York, Trade Agents.

Scientific Books Our catalogue S, is sent free for the asking. It lists books pertaining to all the sciences. A copy should be had for ready reference by those desiring electrical, medical, engineering, scientific, mining and technical books, which we sell to everybody at wholesale prices.

Montgomery Ward & Co., Chicago.

TIPS TO INVENTORS How and where to get a good patent —cost—promotion —Sale. Full instructions and terms. **"The Inventive Age, Washington, D. C."**—7th year of only publication exposing frauds on inventors.

Photographic Times.—Exquisite! That just about expresses the general opinion regarding the *Photographic Times*, an illustrated monthly magazine devoted to the interests of artistic and scientific photography. The March number is no exception. Typographically it is a beauty. While to the photographer, whether professed or amateur, it is an indispensible necessity.

.CAMERAS.

From $2.50 to $100.00

DEVELOPERS, TONING AND FIXING BATHS, NEGATIVE RACKS, PLATES, TRAYS, PAPERS, TRIPODS, PRINTING FRAMES, CARDS, ETC., ETC

CATALOGUE FREE. DEALERS SUPPLIED.

JAS. H. SMITH & CO., 311 WABASH AVE., CHICAGO.

USE THE

Standard Dry Plate.

They are the best high grade plate on the market, which are sold at the lowest popular prices.

Incomparable for the Studio and Hand Camera, absolutely clean, uniform and rapid.

We manufacture Non-Halation process, transparencies, plain and ground glass, lantern slide and X-ray Plates.

You will make no mistake in ordering the "STANDARD."

STANDARD DRY PLATE CO.,
LEWISTON, MAINE.

THE WATERBURY ALBUM

Is the latest thing on the market in the way of an Interchangeable Leaf Album.

Embossed Black
Cloth Covers,
White Leaves.

NOTE THE LIST PRICE.

7 x 10,	10 x 12,	11 x 14,
$1.10	**$1.60**	**$2.00**

* * *

THE SCOVILL & ADAMS CO. OF NEW YORK,
60 and 62 East 11th Street, New York City.

Look out for imitations of

WATERBURY CARDBOARD.

Look out for the genuine, too, and see that you get it.

REDUCED PRICE LIST.

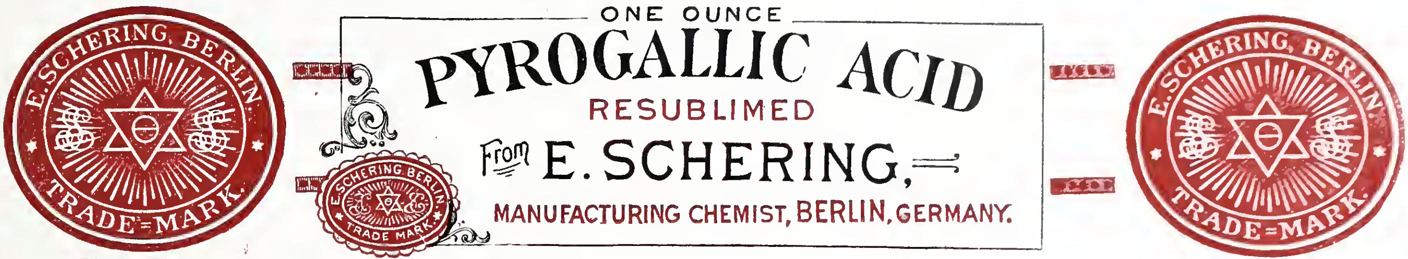
WITH NEW PRICES.
SEND FOR A SAMPLE

ESTABLISHED 1802.

It is the Best and Cheapest.

When purchasing a Developer please be particular to specify **Schering's** the oldest and most favorably known brand.

Put up with labels and seals as per fac-similes here given.


E. SCHERING, BERLIN.
TRADE-MARK
E. SCHERING, BERLIN.
TRADE-MARK
E. SCHERING, BERLIN.
TRADE-MARK

ONE OUNCE
PYROGALLIC ACID
RESUBLIMED
From E. SCHERING,
MANUFACTURING CHEMIST, BERLIN, GERMANY.

REGISTERED. REGISTERED.

THE STANDARD OF THE LAST—THIRD—EDITION OF THE GERMAN PHARMACOPŒIA.

See that you get the Genuine "Schering's." Excelled by none

Send Orders to your Dealers, or to

THE SCOVILL & ADAMS COMPANY OF NEW YORK.

Remember

THAT

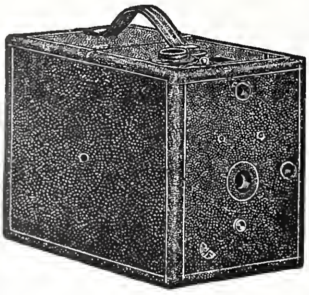
"Three Crown"

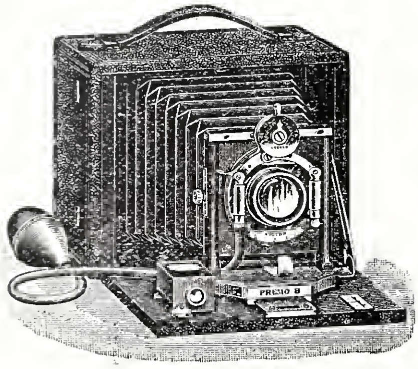
Albumen Paper

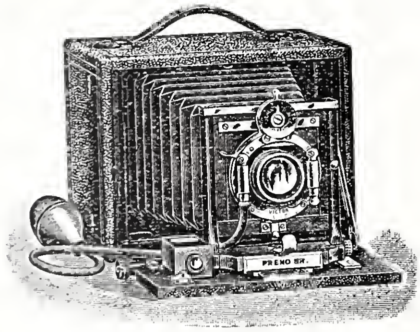
Is absolutely the BEST.

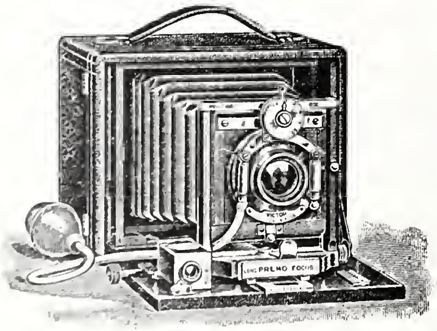
WHY?

Because none but the Best of the Rives Paper is selected for Albumenizing the THREE CROWN BRAND. It is therefore free from the imperfections often to be found in other brands, which arise from defects in the plain paper, and hence cannot be avoided.









PREMO CAMERAS

are made in so many different styles that we cannot tell about them separately here, but we have a beautifully Illustrated Catalogue that we shall be glad to send upon request.

Premos
Produce
Perfect
Pictures

Prices, $5 to $50

* * *

Rochester Optical Co.,

ROCHESTER, N. Y.

A
Critical
Moment

is when purchasing
your first

PHOTOGRAPHIC LENS.

You may buy a very cheap lens "to learn with" and after a time lay it aside, purchase a really good lens and feel that the experience gained is worth the cost of the cheap lens.

A medium-priced lens is always a dear purchase as you can never do first-class work with it, and you don't feel like throwing it away.

The best is always the cheapest, and the best lens made to-day is the

Convertible Anastigmat,

MANUFACTURED BY

Bausch & Lomb Optical Co.,

408 Masonic Temple,
Chicago.

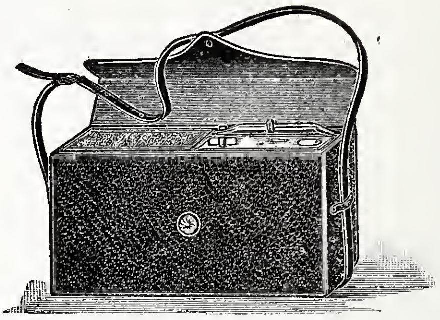
ROCHESTER, N. Y.

130 Fulton Street,
New York.

Attached for use.

We ORIGINATE
thus always in
the lead of all

Our . . Styles . for . '97 . are . com- . . plete.

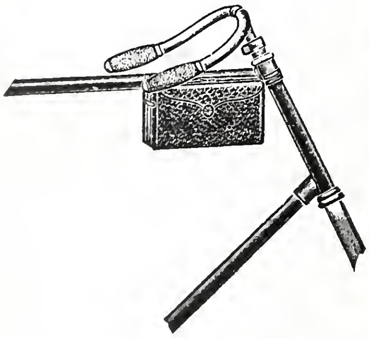


Packed in Case.

POCO and Cycle POCO

ARE ALWAYS LEADERS.

See our Patented Poco combined finder and level, get one for your camera. It is the only perfect view finder made.



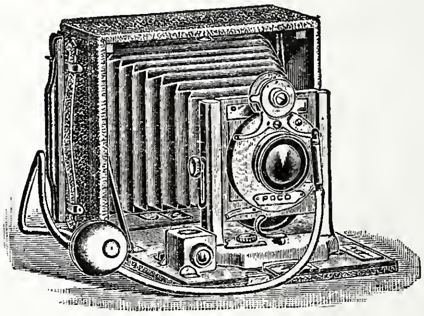
Attached for Carrying.

Poco Cameras

Take everything
in sight.

✱

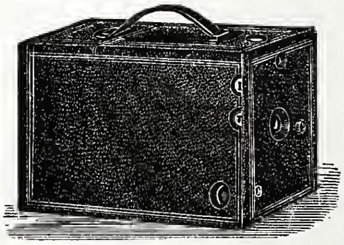
ROCHESTER CAMERA CO.



Open.

GEM POCO

the only $5.00 Camera.

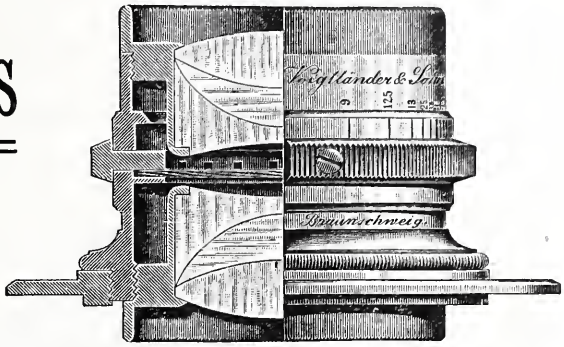


Rochester Camera Co.,
ROCHESTER, N. Y., U. S. A.

The Finest Lens yet Produced

: : : IS : : :

Voigtlander's COLLINEAR



Marvelous LENS.

: : : THE FAMOUS : : :

Voigtlander Portrait and Euryscope Lenses,

Filling special needs, continue their popularity unabated.

The Genuine . **DARLOT LENSES** for all kinds of work, also best for . STEREOPTICONS are still to the fore.

The above Lense for sale by all Dealers and the Sole American Agents:

BENJ. FRENCH & CO., - - Boston, Mass.

Announcement for 1897.

PLATINOTYPE PAPERS OF EXCELLENT AND UNIFORM QUALITY.

AND THE ART REMBRANDT MOUNTS (PATENTED.)

A A—thin paper, having a smooth surface.
B B—heavy paper, having a smooth surface.
C C—heavy paper, having a rough surface.

Sample package of either of these papers with developer, by mail on receipt of 25 cents.

The Platinotype and Rembrandt Mounts (patented) are superior for Art Effects.

Sample package of either A A, B B, or C C papers on receipt of 25 cents.

Sample Portrait or Landscape mounted on Rembrandt on receipt of 15 cents.

Eight Hollinger Portrait Studies on Rembrandts on receipt of $1.50.

Send for Illustrated Pamphlet,

WILLIS & CLEMENTS,

1624 Chestnut Street, - - - - - - Philadelphia.

The Lundelius Magazine Camera, Patented.

For Professionals and Amateurs.

Small, Light, Complete, Always Ready, and under Positive Control.

NO Doors to Open. Slides to Draw.
Plate Holders. Shutters to Set.
Loose Parts. Obstrusive Fixtures.

But only to

Release the Shutter and turn down the Plate.

Operated entirely from the Outside to Focus, Change Plates, Diaphragm, and Speed of Shutter.

Indicator showing the number of unexposed plates.

Made in *three* standard sizes,
3¼ x 4¼, 4 x 5, and 5 x 7.

Fitted with the following Lenses made by Gundlach Optical Co.:

Turner-Reich Anastigmat,
Instantaneous Symmetrical,
and Single Achromatic

All fitted with Iris Diaphragms.

Carries TWELVE Plates or Cut Films.

Catalogue, Testimonials, and Sample Photos on application.

Manufactured by **The Lundelius Camera Co., Incorporated, Port Jervis, N. Y.**

For Night Photography

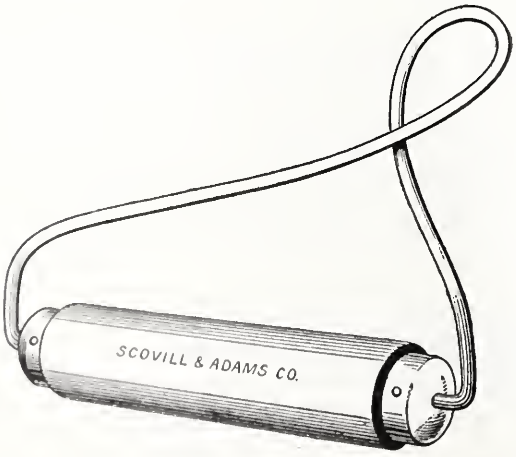
Why?

The Scovill Magnesium Cartridges Are the best

Because they give a more actinic light, produce less smoke, and are safer than any other in the market.

THE SCOVILL & ADAMS CO. OF N. Y.

60 and 62 East 11th Street.


SCOVILL & ADAMS CO.

SOMETHING NEW.

The Simplex Print Roller

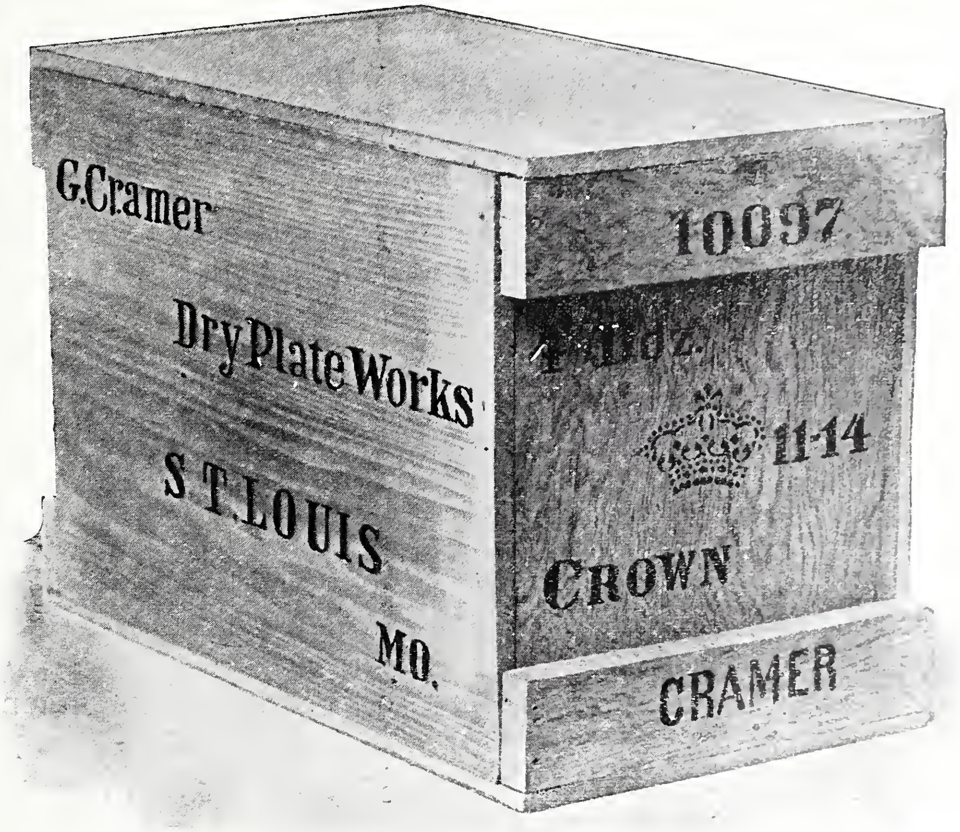
IS SIMPLE AND CHEAP.

ASK YOUR DEALER FOR ONE.

PRICE, 50 CENTS.

FOR SALE BY ALL THE TRADE, AND

THE SCOVILL & ADAMS CO. OF N. Y., Trade Agents.


G.Cramer
Dry Plate Works
ST. LOUIS
MO.
10097
4 Doz.
11-14
CROWN
CRAMER

Nepera Chemical Co.'s Products.

REX and
NEPERA, Glossy Printing-out Papers with a hardened gelatine film.
Rex 90 cents.—Nepera $1.35 a gross.

RUBENS, Glossy collodion, $1.35 a gross.

REMBRANDT, a Matt Printing-out Paper.

NEPERA-BROMIDE,

THE BEST YET MADE

REDUCED PRICES!

Platinoid, for Platinum effects.
Enameled.
Rough-Surface.

VELOX, The Paper of the Future.

Matt or glossy. 500 times quicker than albumen. Can be printed by daylight or by artificial light. No dark room required. Keeps indefinitely. Not affected by heat or dampness.

PERMANENT RESULTS.

50 Cents for trial packages, containing 2 doz. cabs. or 4 x 5 developer and two sample prints.

Nepera Chemical Co.,

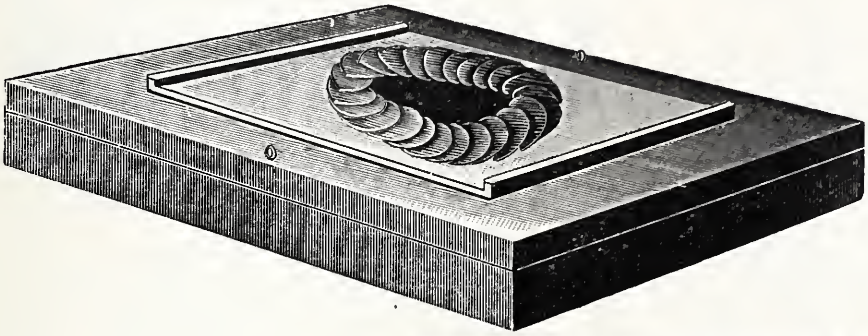
NEPERA PARK, N. Y. = Sole M'f'rs.

Branch offices: CHICAGO, Ill., 19-21 Quincey St. *PARIS, FRANCE, 8 Rue Martel.*

California Camera Co. San Francisco, Trade Agents for the Pacific Coast.

The Dixie Vignetter

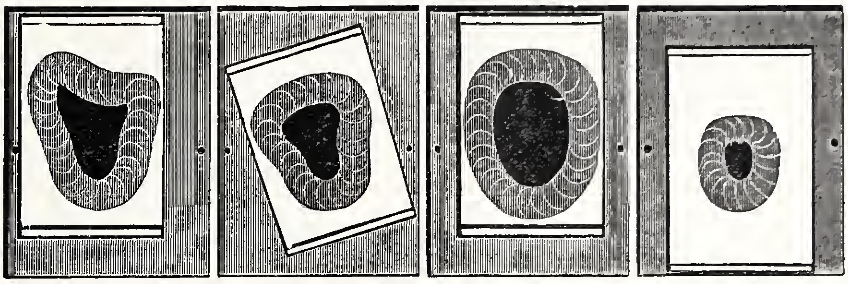
The first and only successful Adjustable Vignetter.



Practical, Cheap, Simple, Durable, and Indispensable to all Photographers who keep up with the times.

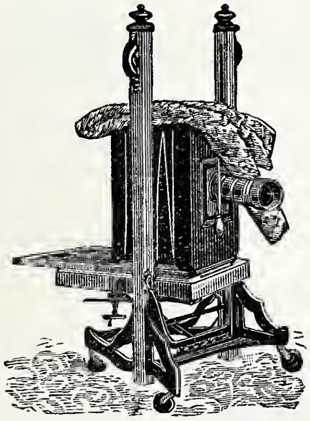
It is attached to the ordinary printing frame, and can be quickly, easily, and accurately adjusted to any negative — the Pear, Oval, Round, Square, or any desired opening can be produced of any size required, and right where it is wanted.

The annexed cut shows a few of its many possible adjustments. The Dixie Vignetter is all complete. No separate parts to cost extra and get mislaid and broken, and it is always ready for use. It costs but a trifle and will pay many a dollar in time saved, besides producing superior results.



The Scovill and Adams Company of New York,

60 and 62 East Eleventh Street, New York.



700 Photographers

are NOW USING the

SEMI-CENTENNIAL CAMERA STAND.

THIS BEATS THE RECORD.

All Dealers sell them.
All Photographers like them.
All should have them.

Send for Price List. The ONLY Stand that gives satisfaction.

HORGAN, ROBEY & CO.

34 Bromfield St., Boston, Mass.

PRINTING-OUT PAPERS

Send twenty cents in Stamps for Sample Package.

MAXIMA PAPER, for Amateurs and Professionals.

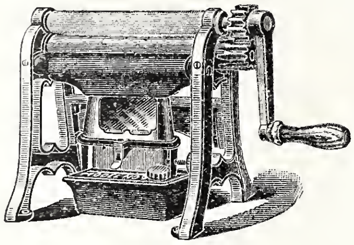
INSOLUBLE FILM.

Invaluable during the winter months owing to its marvellious rapidely in printing. No frilling, on curling, no hardener required. Pure whites. Cabinets, 75 cents per gross. Other sizes in proportion.

United States Aristotype Co.,

Correspondence with Dealers invited. **BLOOMFIELD, N. J.**

JUST OUT **List, $10.00**



8¼ IN. Acme Amateur

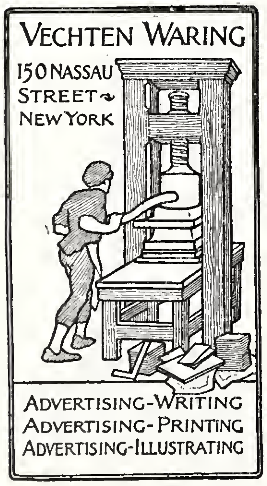
Rotary Burnisher.

FULL NICKEL FINISH. ASK YOUR DEALER FOR SAME.

MANUFACTURED BY

Acme Burnisher Company,

FULTON, N. Y.



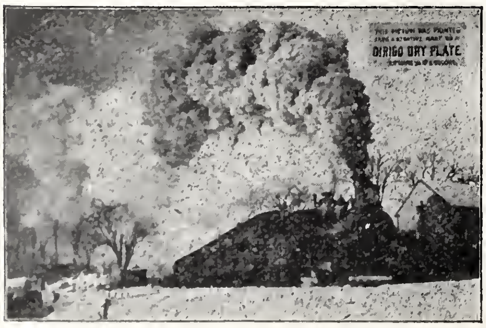
ADVERTISING CAMPAIGNS OUTLINED, AND BUSY MEN HELPED IN THE WRITING OF ADVERTISEMENTS AND THE ARRANGING OF DISPLAY EFFECTS.

ASSISTANCE GIVEN IN THE COMPILING OF CATALOGUES AND PRICE LISTS, AND COPY PUT IN GOOD SHAPE FOR ECONOMICAL PRINTING.

THOUGHT GIVEN TO THE ARTISTIC AND FORCEFUL ARRANGEMENT OF TYPES, AND VERY REAL EFFECTS PRODUCED IN THE ILLUSTRATING OF GOODS FOR CATALOGUES—IN BLACK OR COLORS.

VECHTEN WARING, 150 Nassau St., New York.

Made on Dirigo Dry Plate $\frac{1}{500}$ Second Exposure.



IF YOUR DEALER DOES NOT KEEP THEM SEND DIRECT TO

Dirigo Dry Plate Works, 231 Middle St., Portland, Me.

WANTED—No. 528, Vol. 21; 620-639, inclusive, Vol. 23; 537-551, inclusive, Vol. 22; also title-page and index of Vol. 24 of PHOTOGRAPHIC TIMES, for which 15 cents a number will be paid.

HARTFORD PUBLIC LIBRARY,
Hartford, Conn.

SNAP SHOTS

and all other Photographic Exposures are best developed with

Mitchell's Developing Powders.

They are permanent, portable, convenient and reliable. The developer need only be mixed **when needed**, and is always **fresh and strong.**

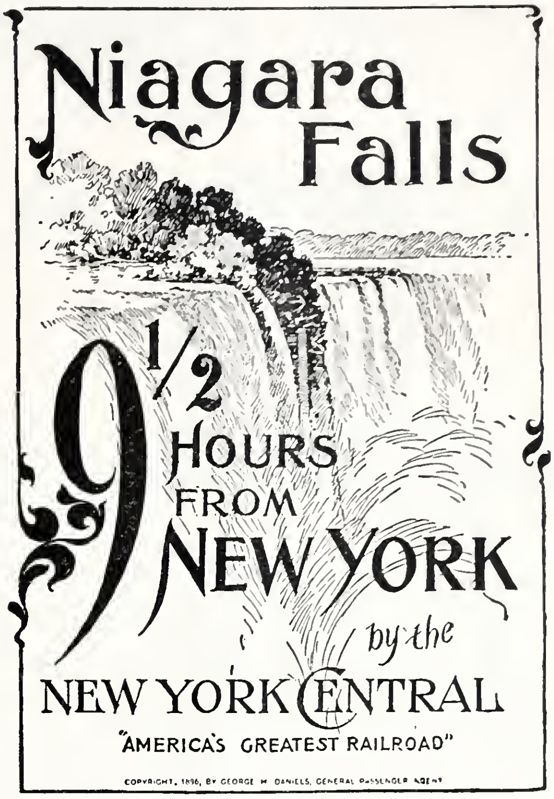
PHAINOGEN	75 cts. per pkg.
EIKO-QUINONE	50 " "
SNAP SHOT	50 " "
BROMIDE PAPER	35 " "
EIKONOGEN	25 " "
HYDROKINONE	25 " "
PYRO	25 " "

CAN BE SENT BY MAIL. POSTAGE 5 CTS. EXTRA.

Ask your local dealer for them. If he does not keep them write to us direct and we will forward promptly by mail on receipt of price and postage. Special descriptive circular **free** on application. Address,

CHARLES L. MITCHELL, M.D.,
1016 CHERRY STREET, PHILADELPHIA.

A full line for sale by the SCOVILL & ADAMS CO.


Niagara Falls
9 1/2 HOURS FROM NEW YORK
by the
NEW YORK CENTRAL
"AMERICA'S GREATEST RAILROAD"
COPYRIGHT, 1896, BY GEORGE H. DANIELS, GENERAL PASSENGER AGENT

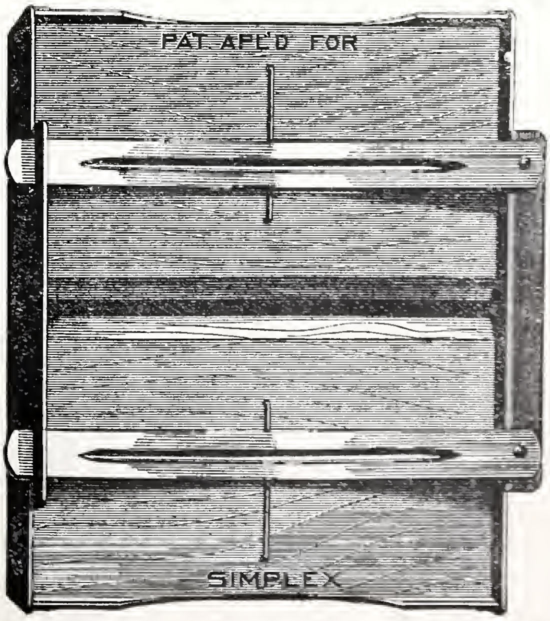
The "SIMPLEX"

Printing Frame

Light, Compact,
Simple, Durable
and Inexpensive.

The Frame is made of Japanned Iron, with Wooden Back, covered with Billiard Cloth.

IT SELLS ON SIGHT!



Prices as follows:

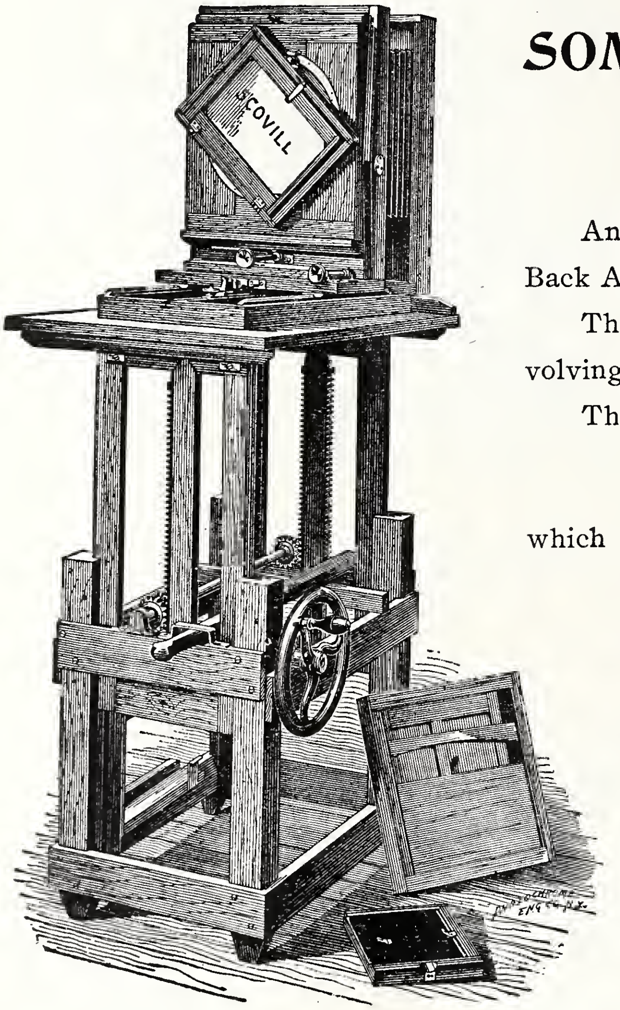
3¼ x 4¼, 3½ x 3½,	24c.
4 x 5,	25c.
5 x 7,	32c.
5 x 8,	35c.

For Sale by all Dealers, and....

The Scovill & Adams Co. of N. Y.,

60 & 62 East 11th Street, NEW YORK.

The Empire Portrait Outfit



SOMETHING NEW

For the Gallery.

An 8 x 10 Portrait Camera, fitted with a Revolving Back Adjuster for 5 x 7 plates.

The position of the plate is changed by simply revolving the turn table of the adjuster.

The outfit comprises also an

Empire Camera Stand

which description we give as follows :

Highest Point from Platform to Floor, ...	**41**	**Inches.**
Lowest Point from Platform to Floor, ...	**26**	"
Width of Platform, ...	**18**	"
Length of Platform, . . .	**30**	"

THE elevating is done by turning a handled wheel at the side of the stand ; the gearing from this connects with the front and rear platform support, causing the platform to rise or fall according to which way the handle is turned.

All the back of the stand is a lever, which, when pressed to the right, throws the gear wheel in front out of gear, and locks the front platform support. On turning the handled wheel from you, the back of the platform is raised, giving the platform an inclination forward of about 15 degrees. By pressing the lever arm to the left the front gear is again placed in position, and upon turning the handled wheel from you, the platform may be raised without disturbing the dip of the platform. If the handled wheel is turned toward you, the platform will be lowered without disturbing the dip of the platform.

Price of Equipment complete, . . . $45.00.

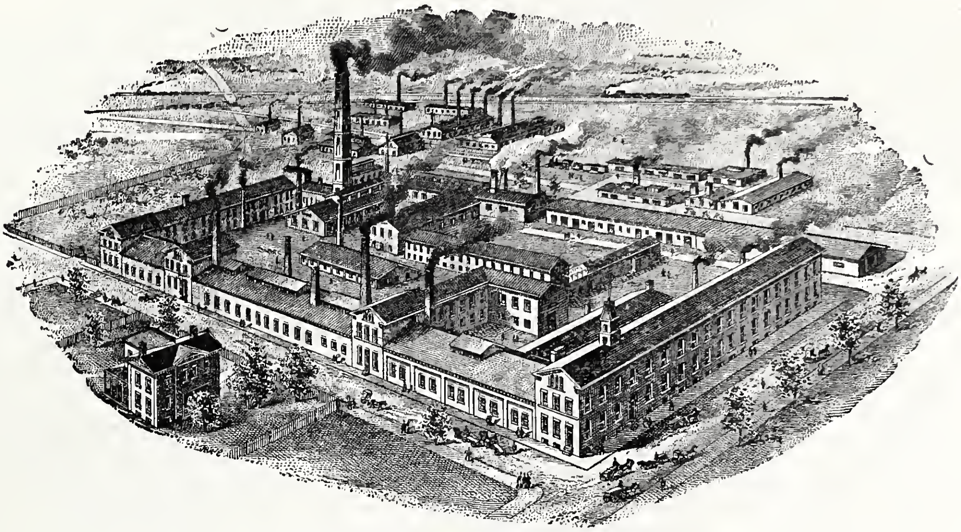
For Sale by all Dealers, and...

THE SCOVILL & ADAMS CO. OF N. Y.,
60 and 62 East 11th Street, NEW YORK.

CHAS. COOPER & CO. ESTABLISHED 1857.

Manufacturing Chemists and Importers,

194 WORTH STREET,
NEW YORK.



WORKS AT NEWARK, NEW JERSEY.

Chemically Pure Photo Chemicals.

NITRATE SILVER, CHEMICALLY PURE CHLORIDE GOLD,
SULPHITE SODA CRYSTALS AND GRANULAR. : : : : :
: : LITMUS PAPER, ACID SULPHITE SODA SOLUTION,
COMMERCIAL AND CHEMICALLY PURE ACIDS, ETHERS
AQUA AMMONIA, SOLUBLE COTTON FOR COLLODION PAPER.

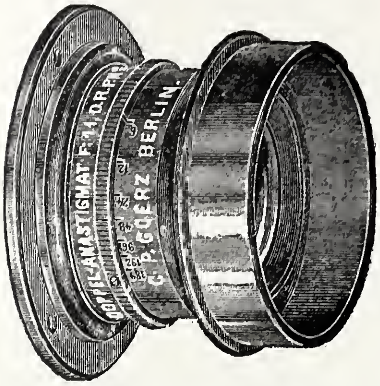
We Manufacture a full line of Chemicals,
Medicinal, and for the Arts and Technical purposes.

Bromo-Oxygen, a most efficient disinfectant and deodorizer. Can be diluted with 32 parts of water.

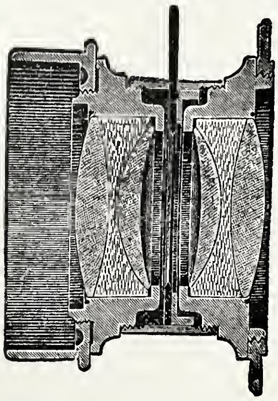
MONTHLY PRICE LIST ISSUED. REFINERS OF PHOTO SILVER AND GOLD WASTE.

CARDS FOR MOUNTING PHOTOGRAPHS.

A. M. Collins Manufacturing Co.
No. 527 Arch St. PHILADELPHIA.



German Patent No. 74,437.
American Patent No. 528,155.



TRY THE GOERZ

Double Anastigmat

Before Buying Another Lens.

It will give you better definition, greater depth of focus and more illumination, over the whole of your plate than any other lens on the market.

FOR SALE BY ALL DEALERS OR

C. P. GOERZ,

52 Union Square East, - - - *NEW YORK.*

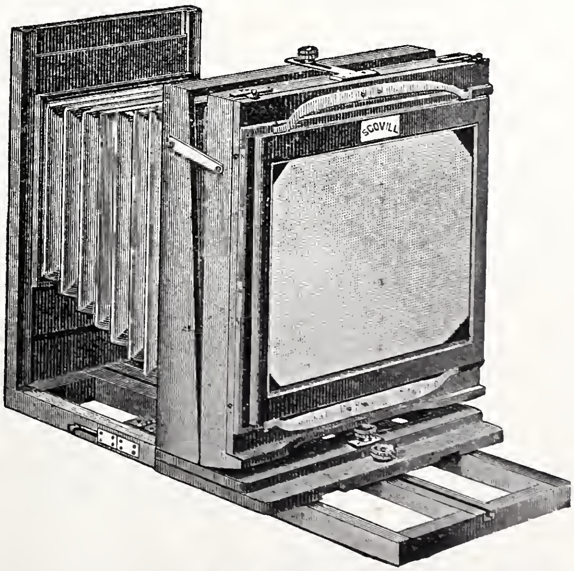
Factory at Berlin (*Germany*).

A NEW CAMERA

"The Reversible Landscape"

MADE BY THE AMERICAN OPTICAL CO.

To meet the demand for high-grade apparatus at popular prices. This camera is made of highly polished mahogany, with all the latest improvements, and patent self-adjusting ground glass frame, reversible back, and rising front.



PRICES:

6½ x 8½	Double Swing	$23.00
8 x 10	" "	25.00
11 x 14	" "	35.00
14 x 17	" "	50.00

THE SCOVILL & ADAMS CO. OF N. Y., 60 and 62 East 11th Street.

The Scovill & Adams Co.

Of New York.

60 & 62 East Eleventh Street, N. Y.

Are Trade Agents for and Supply:

THE GOERZ (NEW) DOUBLE ANASTIGMAT LENSES (Patented).
THE MORRISON FAMOUS WIDE ANGLE LENSES.
THE CELEBRATED WATERBURY (SINGLE ACHROMATIC) LENSES.

⁂

THE AMERICAN OPTICAL COMPANY'S APPARATUS.
THE FLAMMANG-SCOVILL-LEVY SCREEN PLATE-HOLDERS (Patented).
ALL STANDARD PHOTO-ENGRAVING GOODS.
SCOVILL REVERSING APPARATUS.
SCOVILL THREE-COLOR SCREENS.

⁂

HAMMER DRY PLATES.
THREE CROWN ALBUMEN PAPER.
EMPIRE COLLODION GLOSS (ARISTOTYPE PAPER).
EMPIRE COLLODION MATT (ARISTOTYPE PAPER).
EMPIRE GELATINE (ARISTOTYPE PAPER).

⁂

"DIXEY" VIGNETTERS.
SCOVILL (Patented) ZINC ADJUSTABLE WASHING BOXES.
SCOVILL (Patented) MAGNESIUM CARTRIDGES.
THE "WORLD" SPECIAL PHOTO-FINISH BLOTTING PAPER.
"SWEETHEART" ADHESIVE CLOTH.

⁂

S. P. C. CHEMICALS AND PREPARATIONS.
MERCK'S PYRO.
"NON-COCKLE" MOUNTING PASTE.
REIFSCHNEIDER'S "ECLIPSE" AND "REGENT" ALBUMS.
WATERBURY CARDBOARD.

⁂

THE SCOVILL PHOTOGRAPHIC SERIES OF PUBLICATIONS.
THE AMERICAN ANNUAL OF PHOTOGRAPHY.
THE PHOTOGRAPHIC TIMES (MONTHLY).
THE PRACTICAL PROCESS WORKER (MONTHLY).
EL PROGRESO FOTOGRÁFICO (MONTHLY).

Descriptive Catalogues and Special Price Lists on application.

Correspondence Solicited

Capital is the important item of business success.

A PHOTOGRAPHER'S capital is the confidence of his patrons. This confidence is gained and retained by permanent photographs.

Permanent photographs depend largely on the paper used.

The leading and successful PHOTOGRAPHERS in this country use

AMERICAN

"ARISTO" PRODUCTS.

The Standard Brands.

Empire Gelatine Paper

Empire Collodion Gloss

Empire Collodion Matt

(FOR CARBON OR PLATINA EFFECTS)

UNIFORM--RELIABLE

EVERY SHEET GUARANTEED

FOR SALE BY ALL THE TRADE.

Manufactured by the Empire Photo Paper Co.

The Scovill & Adams Company of N. Y.

TRADE AGENTS,

60 & 62 EAST ELEVENTH ST., - - NEW YORK, U. S. A.

ASK YOUR DEALER FOR IT.

Vol. XXX. FEBRUARY, 1898. Number 2.
FOUR DOLLARS PER ANNUM. SINGLE COPIES, 35 CENTS.

THE PHOTOGRAPHIC TIMES

AN ILLUSTRATED MONTHLY MAGAZINE DEVOTED TO THE INTERESTS OF ARTISTIC & SCIENTIFIC PHOTOGRAPHY.

THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION 60 AND 62 EAST 11TH. ST. NEW YORK.

CONTENTS.

PAGE
Frontispiece—Twilight from the Battery—By W. A. Fraser.
Autobiographical Sketches—By H. P. Robinson.... 49
A Holiday in the Woods—Illustration............. 50
The Lady of Shalott—Illustration................ 51
The Fisherman—Illustration..................... 53
Composition—By G. Davison—Illustrated 54
Naturalistic Photography—By P. H. Emerson—Illustrated 58
Photographing in the Yosemite—By William D. Murphy.. 61
The Three Brothers—Illustration.................. 61
"Wawona"—Illustration 62
Sentinel Rocks—Illustration 62
Yosemite Falls—Illustration...................... 63
The Domes and Royal Arches and Cloud's Rest—Illustration... 63
Andrew Johnson—Illustration 63
A Big Tree—Illustration 63
El Capitan—Illustration 64
At the Foot of Yosemite Falls—Illustration......... 64
Yosemite from Valley View—Illustrated........... 65
A School of Photography—By Milton B. Punnett—Illustrated.................................... 65
Faking and Control in Principle and Practice—By A. Horsley Hinton............................. 67
"A Deserted Shore," Completed Work—Illustration 68
"A Deserted Shore," Print No. 1—Illustration..... 69
"A Deserted Shore," Print No. 2—Illustration...... 70
"Westward," Preliminary Print—Illustration...... 71
"Westward," Print of Clouds—Illustration........ 71
"Westward," Finished Picture—Illustration....... 72
Latitude of the Plate 74
Au Soleil—By C. Puyo—Illustration.............. 75
The Coming Shower—By L. G. Brengle—Illustration 76
Personality in the Portrait—By J. Rees........... 77
Study of a Head—By W. Smedley Aston—Illustration.. 78
L'Allegro—By Dr. Hall Edwards—Illustration..... 79
Figure Tombale—By C. Puyo—Illustration........ 80
Editorial Notes.................................. 81
Everyday Hints in Development—By W. Ethelbert Henry, C.E 86
The Pyro-Soda Developer—By C. G. and J. C..... 86
An Offending Novelist—By C. S. M............... 87
Bluffs and Farm Lands on Big River, Mo.—Illustration.. 87
Notes and News.................................. 88
Trade Notes...................................... 92
The Editor's Table 93
Answers to Correspondents........................ 94
Our Competitions 95
Patents of the Month............................. 96
THE ENCYCLOPÆDIC DICTIONARY OF PHOTOGRAPHY.. 409

ONE GROSS CABINETS $3\frac{7}{8}$x$5\frac{1}{2}$
DELTA MATT
COLLODION PAPER
SUPERIOR
CARBON AND PLATINUM
EFFECTS
MANUFACTURED BY
NEW JERSEY ARISTOTYPE CO.
BLOOMFIELD, NEW JERSEY.
ONE GROSS DELTA MATT CABINETS $3\frac{7}{8}$x$5\frac{1}{2}$

A PERFECTED ARTICLE,

COMPARISON UNVEILS SUPERIOR MERIT.

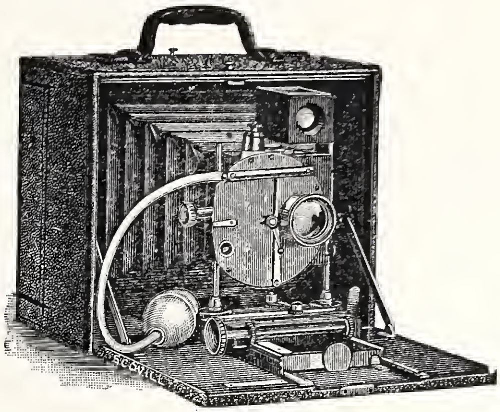
CAMERAS FOR NOTHING.

Our Special Offer.

TO ANYONE sending us twenty-five yearly subscriptions for this magazine we will give **Free of all charge** a beautiful 4 x 5 **Henry Clay Camera** complete with lens, shutter, etc,,

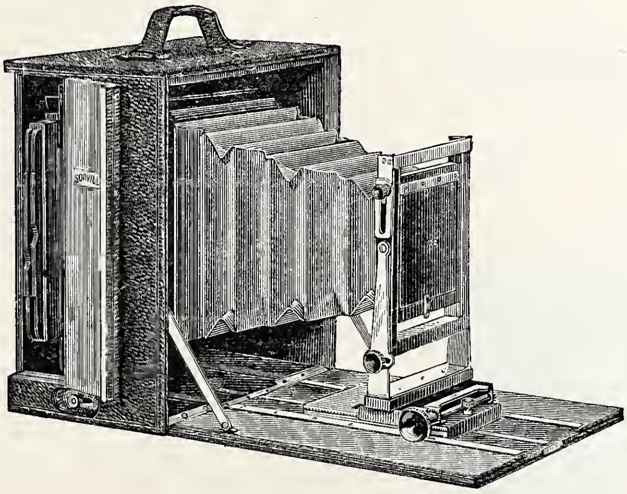
TO ANYONE sending us fifty yearly subscriptions to this magazine we will give **free of all charge** a magnificent 8 x 10 **Irving Clay Camera.**

BOTH these cameras are marvels of workmanship and the finest grade of apparatus manufactured by the American Optical Co.



4 x 5 Henry Clay Camera,

For 25 Subscriptions to The Photographic Times.



8 x 10 Irving Clay Camera,

For 50 Subscriptions to The Photographic Times.

Send in your subscriptions as you receive them and they will be credited to your account.

Each subscription must be accompanied with the cash in payment therefor.

Two half-year or four quarterly subscriptions will count as one year's.

Give full name and address of subscriber. One yearly subscription costs $4.00, half-yearly $2.00, and quarterly $1.00.

The Photographic Times Publishing Association,

60 and 62 East 11th Street, New York.

THE NEW TRIUMVIRATE

FOR 1898

HENRY CLAY

KLONDIKE

SOLOGRAPH

Scovill high grade

CAMERAS

at popular prices

KLONDIKE, PRICE $5.

Send for description of these Cameras.

SOLOGRAPH 4 X 5, PRICE $35.

HENRY CLAY, PRICE $85.

THE SCOVILL & ADAMS CO. OF N. Y.

60 and 62 East 11th Street, New York.

SECOND EDITION - - THIRD THOUSAND.

"Sunlight and... Shadow"

A BOOK FOR PHOTOGRAPHERS,

.....AMATEUR AND PROFESSIONAL.....

BY W. I. LINCOLN ADAMS.

Containing Chapters and Illustrations by such well-known photographic writers and workers as

H. P. ROBINSON,
ALFRED STIEGLITZ,
A. HORSLEY HINTON,
R. EICKEMEYER, Jr.,
W. B. POST,
J. WELLS CHAMPNEY,
B. J. FALK,
ALEXANDER BLACK,
W. A. FRASER,
HER GRACE THE DUCHESS OF SERMONETA,
and the MARQUIS DE ALFARRAS.

It covers the field entirely, as shown by the following

Contents

THE CHOICE OF SUBJECT.
LANDSCAPE WITHOUT FIGURES.
LANDSCAPE WITH FIGURES.
FOREGROUNDS.
THE SKY.
OUT-DOOR PORTRAITS AND GROUPS.
THE HAND CAMERA.
INSTANTANEOUS PHOTOGRAPHY.
WINTER PHOTOGRAPHY.
MARINES.
PHOTOGRAPHY AT NIGHT.
LIGHTING IN PORTRAITURE.
PHOTOGRAPHING CHILDREN.
ART IN GROUPING.

About 150 pages of the most instructive and entertaining reading matter,

....AND....

: : : *More than 100 Beautiful Photo Engravings* : : :

MANY OF THEM FULL-PAGE PICTURES.

Printed on Heavy Wood-cut Paper, with liberal margins and gilt edges.
Beautifully and Substantially bound in Art Canvas, with gilt design.

PRICE, IN A BOX, $2.50

Sent post free by mail, to any address, on receipt of amount by

The Scovill & Adams Company of New York,

60 and 62 East Eleventh Street, New York City.

"Sunlight and Shadow."

Following are some extracts from reviews of greater or lesser length, which have recently appeared in the public press in regard to "**Sunlight and Shadow**" by W. I. LINCOLN ADAMS. We have only room for the merest extracts.

"It would be an appropriate gift to a friend interested in photography as an amateur."—*Cleveland Plain Dealer.*

"The book contains a hundred exquisite half-tone engravings."—*Baltimore American.*

"For the photographer who desires to advance in pictorial photography, these articles and illustrations by some of the best photographers in landscape and studio art, gathered by the author of this volume, are full of helpful suggestions and aid to acquiring some degree of skill in the art. All the difficult points are dealt with." —*Providence Journal.*

"The friend of the kodak fiend. Can you do him a greater kindness than to remember him at Christmas with a copy of 'Sunlight and Shadow'"?—*Detroit Free Press.*

"The mechanical work is excellent and it is a marked additional beauty to the many illustrations"—*Chicago Inter-Ocean.*

"Although the work seems almost too fine to handle, it is thoroughly practical. It is profusely and exquisitely illustrated, and the photographer who possesses it will find it not only a thing of beauty in itself, but a work of profit."—*Boston Transcript.*

"The volume is a model of fine printing, is full gilt and tastefully bound; just the present for an ardent camerist."—*Buffalo Express.*

"Everyone interested in the growth of photography will welcome this work."—*Arts for American.*

"It deals practically with themes of vital interest and they are handled with expert ability, while the pictures are the best reproductions we have ever seen."—*Congregationalist.*

"Pleasure as well as profit awaits the owner of this handsome volume."—*Philadelphia Ledger.*

"No more acceptable gift could be made to an amateur photographer than a copy of 'Sunlight and Shadow.'"—*Philadelphia Press.*

"Attractive, clean and fertile in suggestions to the owner of the camera."—*Milwaukee Sentinel.*

"It shows that improvement may be done in book illustration by the skilful camera artist."—*San Francisco Chronicle.*"

"If any one questions the fact that photography is becoming a fine art he only needs to look over the charming pages of this volume and study the handsome illustrations."—*Evangelist.*

"It seems hardly decent to resist any longer the claim certain phases of photography have to acceptance as high art."—*Current Literature.*

"The illustrations which are so handsome as to make the volume an artistic treasure, aside from its helpfulness, are made from original photographs from nature." —*The Interior.*

"An excellent book for the amateur photographer who has made some progress in the practice of his art, and may be quite as useful to the professional."—*The Art Amateur.*

"Its recommendations are universally judicious and practical."—*The Critic.*

"It contains valuable information as to the best methods of reaching perfection in photography."—*Minneapolis Tribune.*

"All very tasteful, very attractive."—*Literary News.*

A Selected List of Books

From the Scovill & Adams Co. of New York Book Catalogue.

	Price per copy
Amateur Photography. A Practical Guide for the Beginner. By W. I. Lincoln Adams. Illustrated. Paper covers, 50c.; cloth bound	$1 00
Lantern Slides and How to Make Them. By A. R. Dresser. A new book, very complete and practical	25
Photography at Night. By P. C. Duchochois. Illustrated. 108 pp. Paper covers	1 00
The Knack. Written expressly to help the beginner in perplexity, reduced to	25
Photographic Lenses; Their Choice and Use. By J. H. Dallmeyer. A special edition, edited for American photographers. In paper covers	25
The Chemistry of Photography. By Prof. Raphael Meldola	2 00
The Photographic Image. By P. C. Duchochois. A Theoretical and Practical Treatise on Development. Paper covers	1 50
Cloth bound	2 00
The Ferrotyper's Guide. For the ferrotyper, this is the only standard work. Seventh thousand	75
The Photographic Studios of Europe. By H. Baden Pritchard, F.C.S. Cloth bound, $1.00; paper covers	50
History and Hand-Book of Photography. With seventy illustrations. Cloth bound, reduced to	50
Crayon Portraiture. Complete instructions for making Crayon Portraits on Crayon Paper and on Platinum, Silver and Bromide Enlargements; also directions for the use of Transparent Liquid Water Colors, and for making French Crystals. By J. A. Barhydt. A new edition. Paper covers	
Cloth bound	1 00
Art Recreations. Ladies' popular guide in home decorative work, with a chapter on photography. Edited by Marion Kemble	1 00
The Photographer's Book of Practical Formulas. Compiled by Dr. W. D. Holmes, Ph.B., and E. P. Griswold. Paper covers, reduced from 75c. to 30c.; cloth bound, reduced from $1.50 to	60
American Hand-Book of the Daguerrotype. By S. D. Humphrey. (Fifth Edition.) This book contains the various processes employed in taking heliographic impressions	25
"Sunlight and Shadow" a book for Photographers, Amateurs and Professionals. By W. I. Lincoln Adams. Illustrated with over 100 handsome photo-engravings. Beautifully and substantially bound. Price in a box	2 50

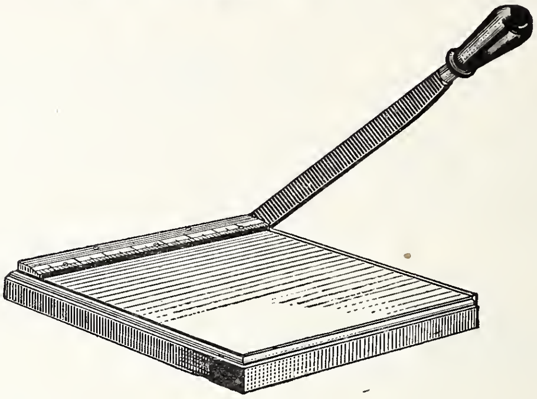
Simplex Print Trimmer.

* * *

Cheaper than any other.

Better than all the others.

* * *



In the manufacture of this Trimmer we have given special attention to the knives, with the result that they are more evenly tempered, and better adjusted than those costing double.

COMPARE OUR PRICES WITH ALL THE OTHERS.

No. 0. 7 inch blade	*$2 00.*
No. 1. 8½ inch blade	*2 25.*
No. 2. 10 inch blade	*2 50.*

Discount to the trade upon application to

THE SCOVILL & ADAMS CO. OF NEW YORK,

60 and 62 East 11th Street.

ARE YOU A SUBSCRIBER

TO THE

St. Louis & Canadian Photographer?

NO?

WELL, YOU ARE BEHIND THE TIMES.

Send 50 Cents at once for a

3 MONTHS' TRIAL TRIP.

EVERY NUMBER HANDSOMELY ILLUSTRATED.

Amateurs like it. Professionals cannot do without it.

"I wish you success in the new Editorship, and hope that the good work of the Journal will go on, and that it will still continue to uphold and build up the legitimate photo business."

C. P. McDANNELL,
Cambridgeboro, Pa.

"Why, of course, we wish to renew. You would not expect us to try and run business without it."

E. LONG & SON,
Quincy, Ill

$3.00 per Year, $1.50 for Six Months.

Mrs. FITZGIBBON-CLARK,

2714 Olive St., ST. LOUIS, MO.

SUBSCRIPTIONS RECEIVED BY ALL DEALERS.

WANTED

FREAK PHOTOS

Caricature Portraits and other Photographic Curiosities. A liberal price will be paid. Address L L., Care Editor,

THE PHOTOGRAPHIC TIMES

60 and 62 East 11th St., New York,

The S. & A. Photographic Series.

	Price per copy.
No. 1. **The Photographic Amateur.** By J. Traill Taylor. A Guide to the Young Photographer, either Professional or Amateur. (Second Edition.) Paper covers, 50 cents. Cloth bound (Library Edition)	$0 75
No. 5. **Photography with Emulsions.** By Capt. W. De W. Abney, R.E., F.R.S. A treatise on the theory and practical working of Gelatine and Collodion Emulsion Processes. (Second Edition.) Paper covers	75
No. 7. **The Modern Practice of Retouching.** As practiced by M. Piquepé, and other celebrated experts. (Ninth Edition.) Paper Covers Cloth bound (Library Edition)	50 75
No. 8. **The Spanish Edition of How to Make Pictures.** Ligeras Lecciones sobre Fotografia Dedicados a Los Aficionados. Cloth bound, 75 cents. Paper covers	50
No. 12. **Hardwich's Photographic Chemistry.** A manual of photographic chemistry, theoretical and practical. Ninth Edition. Edited by J. Traill Taylor. Leatherette binding	2 00
No. 13. **Twelve Elementary Lessons on Silver Printing.** (Second Edition.) Paper covers	50
No. 14. **About Photography and Photographers.** A series of interesting essays for the studio and study, to which is added European Rambles with a Camera. By H. Baden Pritchard, F.C.S. Paper covers Cloth bound (Library Edition)	50 75
No. 15. **The Chemical Effect of the Spectrum.** By Dr. J. M. Eder. Cloth bound, 50 cents. Paper covers,	25
No. 16. **Picture Making by Photography.** By H. P. Robinson. Author of Pictorial Effect in Photography. Written in popular form and finely illustrated. Library Edition, $1.00. Paper Covers	75
No. 20. **Dry Plate Making for Amateurs.** By George L. Sinclair, M.D. Pointed, practical and plain. Leatherette binding	50
No. 21. **The American Annual of Photography and Photographic Times Almanac for 1887.** (Second Edition.) Paper cover; (postage, 12 cents additional) Library Edition; (postage, 12 cents additional)	50 1 00
No. 22. **Photographic Printing Methods.** By the Rev. W. H. Burbank. A Practical Guide to the Professional and Amateur Worker. Paper. (Third Edition)	1 00
No. 23. **A History of Photography.** Written as a practical guide and an introduction to its latest developments. By W. Jerome Harrison, F.G.S., and containing a frontispiece of the author. Cloth bound	75
No. 24. **The American Annual of Photography and Photographic Times Almanac for 1888.** Illustrated. (Second Edition.) Paper; (by mail, 12 cents additional.) Library Edition; (by mail, 12 cents additional)	50 1 00
No. 25. **The Photographic Negative.** A Practical Guide to the Preparation of Sensitive Surfaces by the Calotype, Albumen, Collodion, and Gelatine Processes, on Glass and Paper, with Supplementary Chapter on Development, etc., by the Rev. W. H. Burbank. Cloth bound. Reduced from $1.50 to	1 00
No. 26. **The Photographic Instructor for the Professional and Amateur.** Being the comprehensive series of Practical Lessons issued to the Students of the Chautauqua School of Photography. Revised and enlarged. Edited by W. I. Lincoln Adams, with an Appendix by Prof. Charles Ehrmann. (Fifth Edition, enlarged and revised.) Paper Covers $1.00. Library Edition	1 50
No. 27. **Letters on Landscape Photography.** By H. P. Robinson. Finely illustrated from the Author's own photographs and containing a Photogravure Frontispiece of the Author. Cloth bound	1 50
No. 29. **The Processes of Pure Photography.** By W. K. Burton and Andrew Pringle. A standard work, very complete and freely illustrated. Price, in paper covers, $2.00. Library Edition	2 50
No. 30. **Pictorial Effect in Photography.** By H. P. Robinson. A new edition. Illustrated. Mr. Robinson's first and best work. Cloth bound	1 50
No. 32. **Practical Photo-Micrography.** By Andrew Pringle. Fully illustrated. Cloth bound	$2 50

The S. & A. Photographic Series.

(Continued.)

	Price per copy.
No. 33. The American Annual of Photography and Photographic Times Almanac for 1890.	
Paper cover (by mail, 14 cents additional)	50
Library Edition (by mail, 14 cents additional)	1 00
No. 34. The Optical Lantern. Illustrated. By ANDREW PRINGLE. In paper covers	1 00
Cloth bound	1 50
No. 35. Lantern-Slides by Photographic Methods. By ANDREW PRINGLE. In paper covers	75
Cloth bound	1 25
No. 36. The American Annual of Photography and Photographic Times Almanac for 1891.	
Paper cover (by mail, 15 cents additional)	50
Library Edition (by mail, 15 cents additional)	1 00
Cyclopedic Index for 1891 Annual	10
No. 37. Photographic Optics. A Text Book for the Professional and Amateur. By W. K. BURTON. Paper	1 00
Library Edition	1 50
No. 38.—Photographic Reproduction Processes. Illustrated. By P. C. DUCHOCHOIS. Paper	1 00
Cloth	1 50
No. 39. El Instructor Fotografico. Paper covers, $1.00 Library edition	1 50
No. 41. The Chemistry of Photography. By W. JEROME HARRISON. Cloth bound	3 00
No. 42. Picture-Making in the Studio. By H. P. ROBINSON. Paper	50
Cloth bound (Library edition)	1 00
No. 43. The American Annual of Photography and Photographic Times Almanac for 1893.	
In Paper covers. Postage, 15 cents extra	50
Cloth bound (Library edition). Postage 15 cents extra	1 00
No. 44. The Lighting in the Photographic Studio. By P. C. DUCHOCHOIS. A new edition. In paper covers	75
Cloth bound (Library edition)	1 00
No. 45. The Grammar of Photo-Engraving. By H. D. FARQUHAR. Illustrated. The most complete text book yet published on this subject. Price, in paper covers	2 00
Cloth bound (Library edition)	2 50
No. 46. Industrial Photography. Illustrated. By P. C. DUCHOCHOIS. Being a description of the various processes of producing Indestructible Photographic Images on Glass, Porcelain, Metal, and many other substances. Paper Covers, 50 cents. Cloth bound	1 00
No. 47. The American Annual of Photography and Photographic Times Almanac for 1894.	
Edited by W. I. LINCOLN ADAMS. In Paper Covers. Postage, 15 cents extra.	50
Cloth bound (Library Edition). Postage, 15 cents extra	1 00
No. 48. Aristotypes, and How to Make Them. Giving a complete description of the manufacture and treatment of Gelatino and Collodio-Chloride Papers. By WALTER E. WOODBURY. Illustrated. In Paper Covers	1 50
Cloth bound (Library edition)	2 00
No. 49. The Encyclopedic Dictionary of Photography. Containing over 2,000 references and about 400 illustrations. By WALTER E. WOODBURY, Editor of THE PHOTOGRAPHIC TIMES. In press.	
No. 50. The American Annual of Photography and Photographic Times Almanac for 1895. With over 200 illustrations. Edited by WALTER E. WOODBURY, Editor of "The Photographic Times." In Paper Covers. Postage, 15 cents extra	50
Cloth bound (Library Edition)	1 00
No. 51. The Photo-Gravure. By HENRY R. BLANEY. A very complete and practical book, written by an Expert. In paper covers, 50 cents. Cloth bound (Library edition)	1 00
No. 52. The Platinotype: Its Preparation and Manipulation. By Capt. W. DE W. ABNEY & LYONEL CLARK. Fully illustrated. 174 pages	1 25
No. 53. The Annual, '96. "The American Annual of Photography and Photographic Times Almanac for 1896," with 400 illustrations. Edited by WALTER E. WOODBURY, Editor of THE PHOTOGRAPHIC TIMES. In paper cover, 75 cents; in cloth bound	1 25
No. 54. Half-Tone by the Enamel Process. By ROBERT WHITTET. Fully illustrated and very complete. Price, in pape cover, 50 cents. Library edition	1 00
No. 55. Instantaneous Photography. By Capt. Abney, the great authority. Price in paper covers	75

For sale by all dealers in Photographic goods, booksellers, and sent, postpaid, on receipt of price, by the publishers.

No. 56. Photographic Amusements. By WALTER E. WOODBURY, Editor of THE PHOTOGRAPHIC TIMES In paper covers	1 00

THE SCOVILL & ADAMS CO. OF NEW YORK,
60 and 62 East 11th Street, New York.

Amateur Photography.

"A Practical Guide for the Beginner."

By W. I. LINCOLN ADAMS.
(Illustrated.)

This is a practical treatise for the beginner by one whose experience of, and immediate contact with, the needs of those who are using the camera, in and out of doors, both for pleasure and profit, especially fits him to Help the Beginner.

It will be sent, post-paid, in paper covers on receipt of Fifty Cents.

In handsome Red Cloth Binding, with Gilt Lettering. One Dollar.

Get the Permanent Cloth Binding.

This Book is now in its Third Edition and Sixth Thousand. You cannot afford to be without it.

THE SCOVILL & ADAMS COMPANY OF N. Y.

Short Stories.

One of the most Entertaining Periodicals Published.

BRIGHT. ✻ ***SPICY.***

Just the thing for the Traveler and Summer Resorter or the Hearth-Stone in Mid-Winter.

ALWAYS REFRESHING.

Advertisers reap great benefits from it and express unbounded satisfaction at the results of using its columns.

25 Cents a Copy on all News Stands.

Bryant Building, - 55 Liberty Street, - New York.

A Sample Copy Free if Advertisement is mentioned.

The Victorian Classic . .

A volume especially adapted to the Holidays, but also in perenial demand — the richest, most luminous, most helpful and beautiful of modern poems,—

Tennyson's

In Memoriam....

Critical Preface by Henry Van Dyke.
Exquisitely illustrated by Harry Fenn.

Elegantly printed, bound in silk, boxed, $3.50

"Barring the too glossy paper upon which it is printed [but which the printing of the choice illustrations made necessary. F. H. & H.], there is no detail of the new edition of "In Memoriam," published by Fords, Howard & Hulburt, which calls for anything but praise. The size of the book is convenient, the type used is attractive and clear, and Mr. Harry Fenn's black-and-white accompaniment is in excellent taste, revealing frequently a delicate fancy. . . . . "Dr. Henry Van Dyke. provides a sympathetic preface, and the edition, we do not doubt, will give deep pleasure to a very wide public."—*New York Tribune.*

"The volume is beautiful almost beyond degree, in every particular. The illustrations really illustrate, besides decorating and adding their own undeniable beauty to the supremely beautiful poem."— *The Interior, Chicago.*

Published by
Fords, Howard & Hulbert

For sale by
The Scovill & Adams Co.
of New York

The Practical Process Worker and Photo-Mechanical Printer.

A Representative Monthly Magazine of American Process Work.

Fully Illustrated with Specimens of the Latest Achievements in the Art.

This periodical is conducted by practical men, who give their experience in the laboratory and workshop, not by mere theorists.

Subscription price per annum, 50 cents.
Single Copies, - - - 5 "

ADVERTISING RATES ON APPLICATION.

Edited by WALTER E. WOODBURY.
A. C. LAMOUTTE, Business Manager.

PUBLISHED BY The Scovill & Adams Co. of N. Y.,
60 & 62 East 11th Street, New York.

First Edition Sold Out within a few weeks.

SECOND EDITION NOW READY.

"Photographic ◆◆ ◆◆ Amusements"

BY WALTER E. WOODBURY,
Editor of "THE PHOTOGRAPHIC TIMES."
AND "THE AMERICAN ANNUAL OF PHOTOGRAPHY."

Containing a Description of

A Number of Photographic Experiments and Novel Effects to be obtained with the Camera.

Invaluable to both the Amateur and Professional Photographer.

CONTENTS.

The Mirror and the Camera.
The Photo-Anamorphosis.
Statuette Portraits.
Magic Photographs.
Spirit Photography.
Photography for Household Decoration.
Leaf Prints.
To Make a Pen and Ink Sketch from a Photograph.
Photographs on Silk.
Photographs on Various Fabrics.
Photographs in any Color.
How to Copy Drawings.
Dry-Plates that Will Develop with Water.
Photographing the Invisible.
How to Make Photographs in a Bottle.
Caricature Photographs.
Photographing a Catastrophe.
Sympathetic Photographs.
Wide-Angle Studies.
Silhouettes.
Freak Pictures with a Black Background.
Freak Pictures by Successive Exposures.
Photographing Snow and Ice Crystals.
Photographing Ink Crystals.
Photographing Sea Weed.
Stamp Portraits.
Moonlight Pictures.
Floral Photography.
A Simple Method of Enlarging.
Distorted Images.
Luminous Photographs.
Photographs Without Light.
Electric Photographs.
Pinhole Photography.
Magic Vignettes.
Instantaneous Photography.
Photographing Fireworks.
Lightning Pictures.
The Photochromoscope.
Composite Photography.
Double Exposure Pictures
Tele-photographs.
Artificial Mirages.
Etc., etc., etc.

OVER ONE HUNDRED ILLUSTRATIONS.

Price, in Paper Covers, $1.00. Cloth, $1.50.

Sent post-paid on receipt of price by the Publishers,

THE SCOVILL & ADAMS COMPANY OF NEW YORK,
60 and 62 East Eleventh St., New York, N. Y.

SEND FOR NEW CATALOGUE OF PHOTOGRAPHIC PUBLICATIONS.

SUBSCRIPTION FORM.

THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION,
60 and 62 East 11th Street, New York,

Gentlemen: Please send THE PHOTOGRAPHIC TIMES

for.. year, commencing.. 189 , for which

I enclose..dollars.

Name..

Address..

....

The Leading Photographic Magazine of the World.

TERMS CASH.—To avoid all risks, we prefer remittances by Express, Money Orders, Draft on New York, Post Office Money Orders, Postal Notes, or Registered Letter.

MOSAICS, 1898

IS NOW READY.

Full of Good Things from Cover to Cover.

OVER FIFTY FULL PAGE PICTURES FROM PHOTOGRAPHS BY

STRAUSS, (St. Louis); HOLLINGER, (N. Y.); SCHUMACHER, (Los Angeles); J. F. RYDER, (Cleveland); LANDY, (Cincinnati); PLACE, (Chicago); PACH BROS., (N. Y.); ROOT, (Chicago); STIEGLITZ, (N. Y.); CORE, (N. Y.); MORRISON, (Chicago); GILBERT & BACON, (Philadelphia); ROSCH, (St. Louis); KUEBLER; (Philadelphia); BETZ, (Baltimore); ROSE, (Providence); MINNS; BRUSH, (Minneapolis); KELLMER, (Hazleton); HURD, (Providence); RANDALL; McCRARY & BRANSON; HARRISON, Jr.; TINGLEY; SCHRIEVER, BAKER'S ART GALLERY; SOMERS; SPERRY,

AND A HOST OF OTHER PROMINENT PRIZE WINNERS.

PRACTICAL ARTICLES ON PRACTICAL SUBJECTS BY

BACHRACH; SHERMAN; RYDER; NICOL; MINNS, PUNNETT; ESTABROOKE; SPERRY; DR. SCHUMANN; XANTHUS SMITH; BEELES; Rev. T. PERKINS; CHAPMAN JONES; FARRAND,

and others whose writings are known as helpful.

A Complete, Concise Review of Photography in 1897, with Methods and Formula in detail.

No other Annual gives so representative a collection of the best photographs of the year, or so useful a selection of practical papers on photography.

Price, paper covers, post-free, - - Fifty Cents.
Library edition, cloth-bound, post-free, - $1.00.

EDWARD L. WILSON, 853 Broadway, New York.

THE ENCYCLOPAEDIC DICTIONARY OF PHOTOGRAPHY

which is continued in this issue, was commenced in the number for January, 1896, Vols. xxviii, and xxix bound in cloth, contain the encyclopædia up to date. Will be sent on receipt of Five dollars for each volume by

The Photographic Times Publishing Association,
60 and 62 East 11th St., New York.

Read

"Electricity,"

The Only Independent Electrical Journal
Published in the United States.

ALL THE ELECTRICAL and
FINANCIAL NEWS.

Latest Technical Articles by
Home and Foreign Writers.

☞ THE BEST ADVERTISING MEDIUM.

Published Weekly.
Subscription $2.50 per year. Address,

ELECTRICITY NEWSPAPER CO.,
136 Liberty St., New York.

EVERY
GOOD
PHOTOGRAPHER

Delights in good printing. Send for a copy of *The Printer and Bookmaker*, a journal devoted to Printing, Engraving, Illustrating, Bookmaking, Etc. It is pleasing to the eye, and instructive to the mind.

SUBSCRIPTION PRICE, $2.00 PER YEAR.

HOWARD LOCKWOOD & CO.,
143 Bleecker Street, New York.

Photographic Everything

NEW STORE—Convenient
NEW STOCK—Complete
NEW PRICES—Lowest
NEW IDEAS from everywhere
NEW APPARATUS of all makers
NEW SUPPLIES of old staples

The Scovill & Adams Co. of New York
Nos. 60 and 62 East 11th St.
(Five doors from B'way)

Send 35 cents for a sample number of The Photographic Times, containing about 100 handsome photographic illustrations.

Cameras The Gameland Publishing Company, Incorporated, 63 Rutgers Slip New York, N. Y., will give a large number of cameras to those persons who send to them lists containing the greatest number of words formed from the letters in the word "CAMERAS". The prizes range from $75 Folding Kodaks to pocket cameras. All competitors must send $1 with their lists for one year's subscription to GAMELAND. Contest closes February 15th, 1898. Sample copy of GAMELAND, containing full particulars of contest, **Free.**

INTERESTED IN
ELECTRICITY?

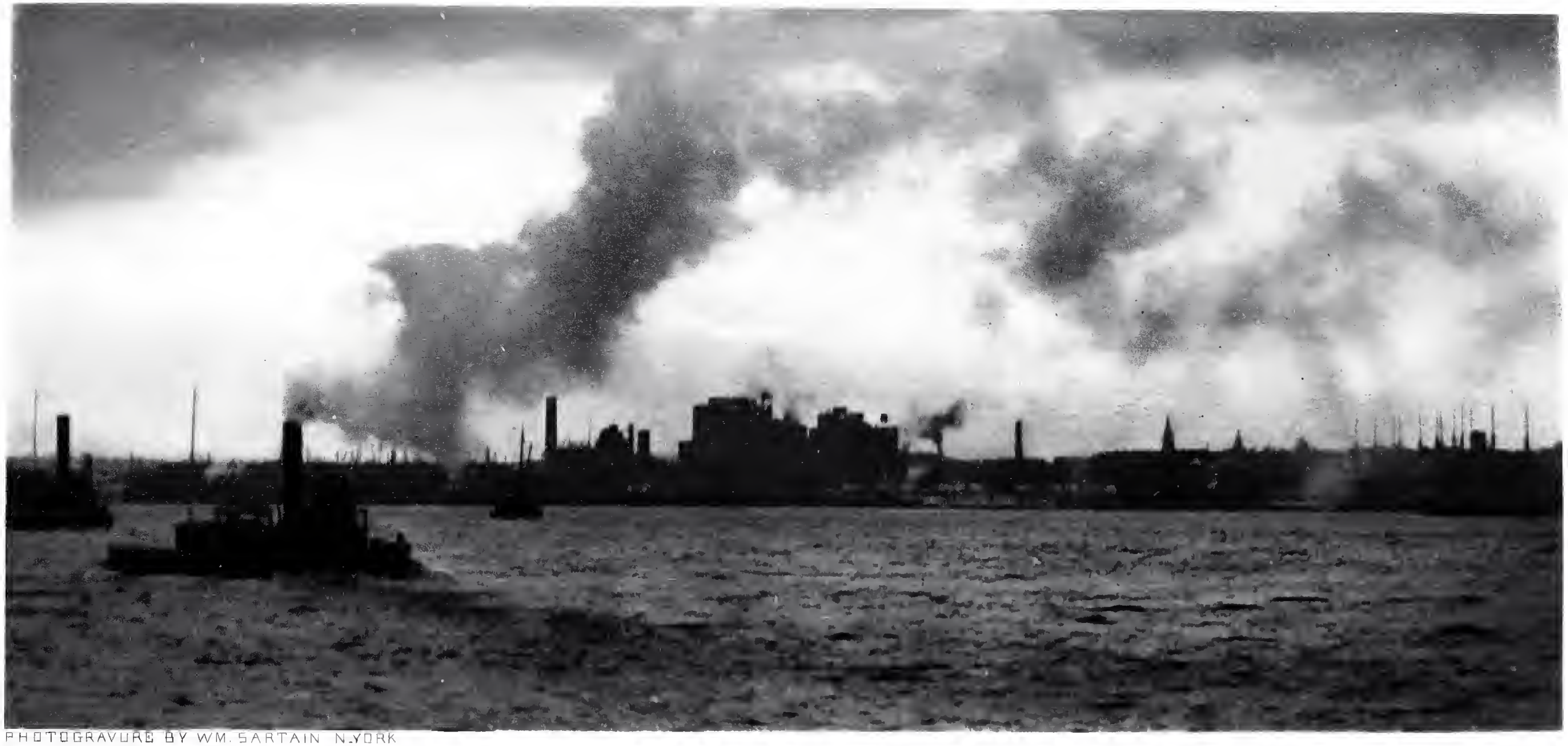
Read The Electrical Engineer.

Published Weekly. Fully Illustrated. Convenient in Size.
ALL THE NEWS.
A series of important articles on the Storage Battery is now running in our pages.

Electrical Engineering Leaflets.

An educational electrical work in three volumes—elementary, intermediate, and advanced grades. $1.50 each.

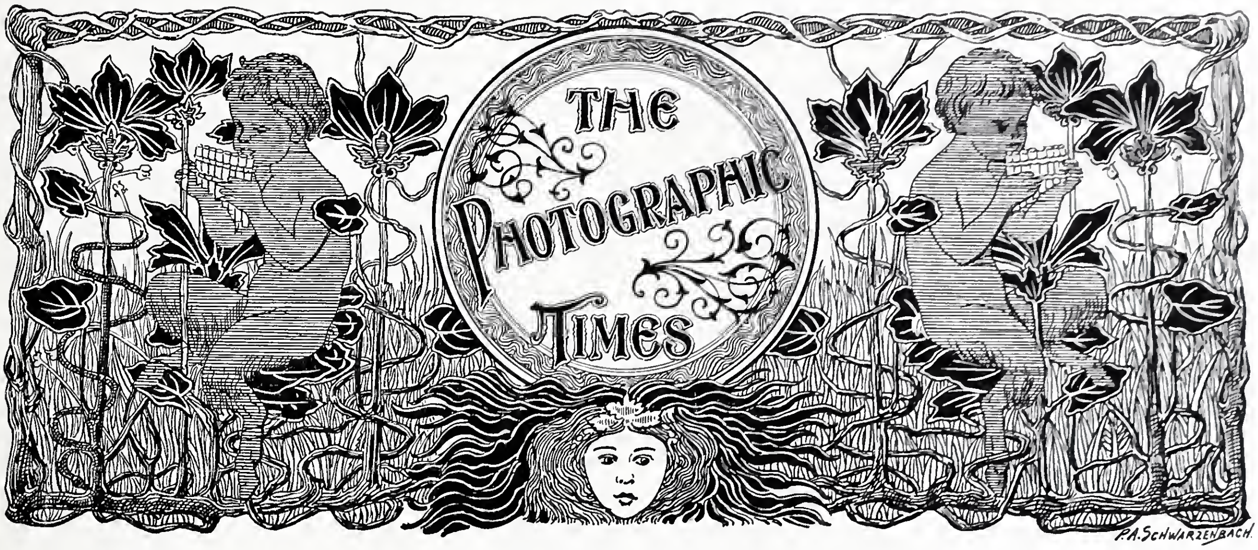
THE ELECTRICAL ENGINEER,
SEND FOR BOOK CATALOGUE. 120 Liberty St., New York.



PHOTOGRAVURE BY WM. SARTAIN N.YORK

TWILIGHT FROM THE BATTERY

BY W. A. FRASER



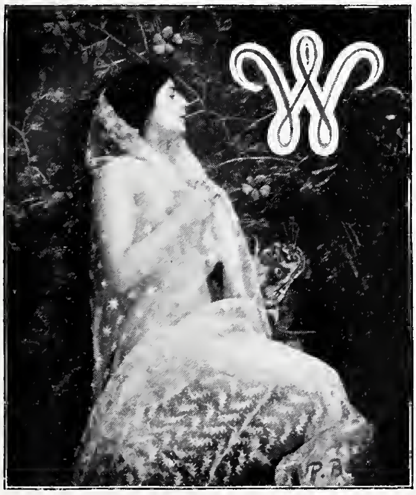
VOL. XXX. FEBRUARY, 1898. NO. 2.

AUTOBIOGRAPHICAL SKETCHES.

CHAPTER VI.

BY H. P. ROBINSON.

> " Fortune's smiles
> Are not by high deserving always won;
> 'Twere easier far to say where will alight
> The thistle down that floats upon the breeze,
> Than fortune's recompenses."



By P. BERGON.

WITH the year 1859 came the dawn of better things. Yet as far as pictorial photography is concerned it is the year of which I am most ashamed. In one other respect, however, it is the year I look back to with more tender feelings. Early in the year I married. I notice in many autobiographies that no notice is taken of this most important event in a man's life, and I will be content to simply record this dip into the proverbial lottery, from which, good fortune still following me, I drew a prize—a prize that is even now protesting against the mention of an event that occurred nearly forty years ago, and is still regarded as the most fortunate of my life. Someone who is peeping over my shoulder orders me to say—of *both* our lives.

I rather think the success of "Fading Away" the previous year paralyzed my artistic faculties for a time. I had great desire to produce a worthy successor to that picture, but felt entirely without inspiration. Quality being lacking, I tried to make up by quantity, which is always a mistake. The consequence was, I exhibited this year a quantity of pictures that proved how little worth showing were photographs that had nothing better to recommend them than technical excellence. The notices in the photographic press were very kind, but I could not help feeling that I had disappointed my friends, which was very annoying to me, and I determined to devote quite unusual attention every year in future to at least one picture for exhibition, and that winter set to work on drawings and sketches, collecting costumes and materials, selecting models and the scene, and preparing the foreground, for a picture to be done in the spring.

It is, I think, believed that I have monopolized a great deal more than my share of space in the exhibitions ever since I commenced, when the fact is that I have been perhaps the smallest (numerically) of all the regular exhibitors, and I do not think that my contributions to the London Photographic Society, and Pho-

Copyright, 1897, by The Scovill & Adams Co. of New York. Entered as Second Class Matter at the New York, N. Y., Post Office.

tographic Society of Great Britain would average four a year. I have never shown at the Royal Photographic Society. I may as well say, now I am on the subject, that I have had a vast deal less to do with the exhibitions of the Photographic Society than has been attributed to me, for the one simple reason that I have never had the chance of doing more. During the later part of the thirty years I was on the council, I never was able to get in an effective word for the improvement of the exhibition. The time of the council meetings was always taken up by interminable talk on other subjects, abstract or theoretical questions, and for some years on Standards—most useful, no doubt, but not very conducive to the advance of pictorial photography. It was only during the last two or three years of my connection with the society that any rejections were allowed to be made. The greatest good I ever did the society was by leaving it, and, with the aid of others, showing how much better a pictorial exhibition could be made by a society exclusively devoted to the subject. The Salon is an example which the Society has had the good sense to imitate in many ways.

A HOLIDAY IN THE WOODS

We will now go back to our theme. It was early in this year that I met with a fright that has happened to so many photographers that a mention of it may be interesting. The business was improving, and I was beginning to escape the shoals, and could see blue water ahead, when a strong opposition was threatened. I heard that a well-known German colorist was coming, and had said that he would "smash up Robinson," and I must own that I was quite inclined to believe that he would do so, knowing him to be very clever, and I knew no way of defending myself, or where to find colorists equal to him. He came, and while he was building his studio a few doors from me I received a letter from another German colorist telling me that he and several others had quarreled with my coming opponent, could they lend me specimens? and more to that effect. They had quarreled with that bitterness, which we can only import from abroad, it is not a native product. I felt under the circumstances I should have been wrong not to accept the offer of their aid, and supplied them with prints which were converted into beautiful colored specimens. The whole place was renovated, and I made a great display. We not only killed the opposition, but put permanent life into the business, so that when I began to be asked for "those new visiting cards," I refused to have anything to do with a matter so trifling. But I soon found my mistake, and by the end of the year was prepared for the rush which was coming for the Carte de Visite.

The Carte de Visite was placed on the market, if I may so describe it, admirably. It is said to have been first introduced in 1857, but I have no recollection of it until 1859. In the *Photographic News*, August 19th, 1859, there is an article commencing "The printing of portraits on visiting cards appears to be more commonly practised in Paris than here," showing that it was little more than talked about. The earliest cartes de visite were full length portraits, and were pictorial gems. They were first made fashionable in Paris, and for once the tyranny of fashion helped photographers. The size was exactly what was wanted, and the proportion beautiful, every subsequent alteration was for the worse and helped towards degeneracy. The full length figure allowed an artist to show his ability, but artists were not plentiful, and in a year or two easier forms began to appear, even to filling the space with the head only. Thus photographers as usual killed the goose that laid the golden eggs. One of the most captivating of the business arrangements was that the fee was one guinea for a sitting, and a certain number, and there was no retouching to add to the cost of production, or the ghastly unnaturalness of the photograph.

Now commenced the palmy times of photography as a business. In 1860 there were not too many photographers, the process was not so difficult as to make it unreliable to ordinary common sense, but too difficult to be every body's business as it has unfortunately become now. The public were not too exacting; ladies had not discovered how lovely (if untrue) it was to look like ivory, and did not always insist on proofs. Besides the Carte de Visite there were the larger portraits. The miniature from five to thirty guineas, and the occasional oil portrait from 50 to 100 guineas. A premature millennium!

THE LADY OF SHALOTT

My hands were always full, and I have never been able to understand how some men knocked off the enormous number of sitters in a day we used to hear of. There may be something in the fact that I took every sitter myself even to preparing and developing the plate; anyway fifteen in a morning was considered as a good day's work, although in the summer it often rose to twenty and twenty-five. In the worst of weather there was seldom a blank day.

Even these comparatively low numbers began to tell on my health, and by order of a higher authority in the house, a pony carriage was ready every day at 2.30 to carry me away from my important customers to a farm house we rented for a few months in the season, or for a drive.

I began my professional career with the determination to take the negative of every photograph to which my name was affixed, and kept up the practice with rare exceptions until the end. I occasionally ran up to London for the week-end, or was away elsewhere for a day or two (long holidays were never expected), and if a sitter came and could not wait he was told that I was away from home and given the chance of being taken by an assistant. It seemed to me dishonorable to claim the work of any man, even if that man was my paid assistant. There seemed a kind of dishonesty in saying a picture was your own work when it was produced by another hand. This was a scrupulosity that was not observed at the time by some others, and is still less practiced at the present time, when a portrait is as a rule looked upon as a mere matter of trade; it is an accepted practice now free from reproach. But there is an analogous practice now on which even the most thick skinned look with disfavor. I mean competing for medals with the work of other photographers, and I have known a case when the winner of an important medal saw the picture with his own name on it for the first time in the exhibition.

Notwithstanding what I have said, I see no objection to a photographer accepting assistance in the production of his picture. The materials, tools, and the mechanical parts of productions should be kept distinct from conception. Both painters and sculptors have assistants. The portrait painter has his "drapery man," the sculptor seldom does much chiselling until the work comes to the finishing. To conceive and carry out the production of the negative of his picture is, with the photographer, to produce and be the author of the work. It is no more necessary for him to have prepared his plates or mixed his developer, than for the painter to strain his canvas or grind his colors. If he wants safely and honorably to put his name on any photograph and call it his own, the subject and arrangement should be on his own conception. What he does by the hand of another should be under his own superintendence and guidance, and the delicate and important parts, such as exposing, developing and part of the printing, which requires mature judgment should be done by himself.

Another resolution I formed at the beginning, was that every sitter should be satisfied if possible. I insisted on giving a re-sitting if the least dissatisfaction was expressed, although the fault had not been my own. I put this feeling throughout the business: "Spent thirty shillings to earn a guinea, if necessary," and found it pay at the end. The mention of a medal reminds me that I ought to say a word on the subject, especially as my first medal belongs to this year.

The news of my first medal was brought to me pleasantly. On a January morning a beautiful little girl came running into the reception room waving a paper, and shouting "I'm first, I'm first." The paper was a telegram from Edinburgh, on which was written, "Run and be first to tell that Mr. Robinson has won the Medal. Deliver this yourself." I kept that piece of paper and have it now before me.

This was, I think, the second year that a medal had been offered for photography in England. It would be difficult to estimate the difference in value between medals now and then. For many years they were offered for the *best* pictures, and to be awarded one was some intimation that you were a master of your art as it then existed. For years it was not possible to win more than three or at least four in the year, if a photographer secured all that was open to him. Now it has been calculated that of late years more than a thousand medals are offered annually, and there are nothing like a thousand exhibitors to take them. This can scarcely be called competition, it is wholesale distribution. Any man who has achieved mediocrity could easily secure, if he laid himself out for it, as some do, thirty or forty annual awards. It has been thought good business by managers of exhibitions to spread medals over the largest number of exhibitors, and every ingenious device was invented to handicap the best photographers, or, we will say, those who usually took medals, until they ceased to exhibit altogether. The result is that the works of the bulk of photographers with high aims are only to be seen at the Salon, and exhibitions in connection with the Salon.

It has been said that I now object to medals because I have completed my collection, and do not want other photographer to make one. They who say these things little know me. My opinion about medals has never changed. I am still in favor of medals judiciously offered and awarded for high merit, and am very proud of of my own collection. I want to see the highest merit encouraged, but not to have every producer of "the usual thing" pampered with the idea that he has already achieved success, and need not exert himself further. In short a medal, as with letters after a name, should be valuable only when it is a mark of high distinction. Otherwise they are but a sordid imitation of honors.

The year 1860 was the wettest, or one of the wettest, years of the century, but nothing checked the Carte de Visite mania. The sitters, as they often said, did not expect us to do them as well as they did "abroad" when the weather was dull, but they made allowances in their splendid ignorance for our being merely English, and seldom grumbled. But the wet weather affected me in another way. It nearly prevented me bringing out the one picture I determined to produce for the exhibition. This was called "A Holiday in the Wood." I give as good an illustration as the only poor reduced copy I possess will afford.

The picture was produced under great difficulties. The figures were done on the only two fine days of April. Then everything was kept ready to drive to Kenilworth for the woodland background, on the first fine day—which did not occur until the 12th of September. I had to wait five months. The picture was as great a success as "Fading Away," without stirring up any opposition on the score of morbid sentiment as that picture had done, if I may judge from the numerous and lengthy eulogistic notices I collected at the time. I was never quite satisfied with it myself.

I do not know that the dry details of the business of portraiture would be of any interest to any one, but I may simply state that I found the Carte de Visite, much as I despised it at the outset, suit me not only as a matter of business, but as a work of art. Every artist finds when he take to professional photography that although there is not a wide gulf between them, that the extremes of the possibilities of sitters are very far apart, and that from a vast quantity of them there is much pleasure or pictorial effect to be got; there is a delight in triumphing over the difficult ones, particularly those who tell you they have tried all the best men, and as a last resource have now come to *you*. But in large business there are many who rouse you to enthusiasm, compel you to make pictures of them, and make you enjoy your life. I found the Carte, though so small, afforded much scope for picture making, and my experience with all kinds of means of art, especially scene painting (for backgrounds) most useful.

It may, however, interest the professional photographer to know the business result to me of the first full year of the Carte de Visite. At the beginning of 1859 the business looked like failure, and I could not get anybody to accept it at a gift; at the end of 1860 I had paid off all debts, spent freely on improving the plant and appearance of the place, and invested a comparatively large sum of money. The business, unsaleable a year ago, was now worth several thousand pounds in the market, and I had not then worked it for all it was worth. There was no advertising or touting after business then, only that amount was done that came of itself. But yet there had been growing a very big advertisement abroad. The picture I did without any hope of profit, and exhibited, brought me sitters from all parts of England, and I have been always pleased to think I did my adopted town some service by attractive visitors, and this effect increased during the next few years.

During the next year the boom increased, sitters often ordered their portraits by the hundred instead of the usual twenty, and I became still more convinced that there was "something in a name," and it is impossible for me to describe the effect of my poor pictorial effects, and the immense indirect effects on the business, without throwing all modesty to the winds, and shocking the genius of autobiography. I have looked through a large book of extracts of these years, and I find them all too eulogistic to quote, but it is satisfactory to find that art in photography was acknowledged even in those early days, and that it was not all invented only a few years ago.

THE FISHERMAN

The history of the year would be the history of the stream of sitters which would be monotonous, the only breaks were when time was found for pictorial work.

The next large picture was produced before eight o'clock in the morning, as there was no other time to spare in the day. For several years I had seen something of the Pre-Raphaelite painters in my friend Munro's studio, and had painted a picture in the feeling of the brotherhood, in which every leaf of a wall of of ivy was painfully studied, and being much interested in the movement, I decided to produce for this year a Pre-Raphaelite photograph. The result was "The Lady of Shalott" from Tennyson's weird poem :

> "And at the closing of the day
> She loosed the chain, the down she lay ;
> The broad stream bore her far away.
> The Lady of Shalott."

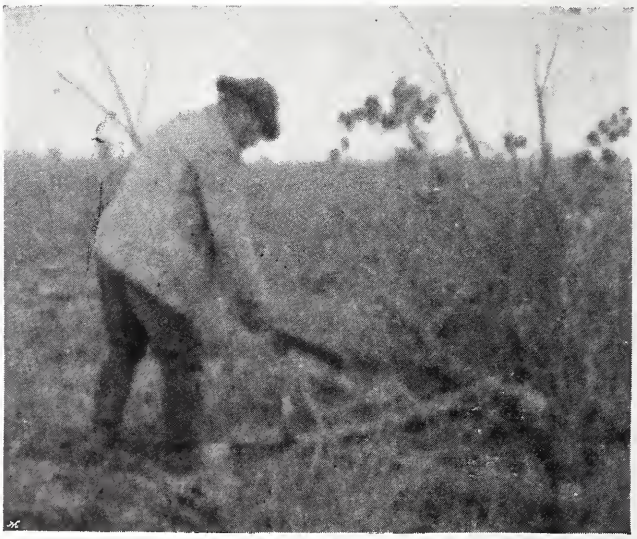
I don't defend any of the absurdities to be easily found in this picture, but it must be remembered that one of my objects was to show the wide scope of photography, that the wierd and wonderful" were as open to the photographer as to the simplest bit of nature. Perhaps I may venture to quote an extract, from a long review which minutely points out the defects and merits, as it shows the general opinions of pictorial photography at the time. "We know very well that there are many non-photographic readers who will smile with complacent pity at the notion of giving embodiment to an imaginary work by means of photography, and regard it as a task more difficult than 'making bricks without straw.' The task is difficult, and we honour the man whose ardent love of, and faith in, his art gives him courage to attempt to realize thus the conception he has found. The work must be a labor of love ; there has been little honor and less profit gained hitherto by such attempts. Artists and art-critics have generally been disposed to sneer at what they deem the presumption of a 'servant of servants.' Even those who should be authorities in matters photographic are often disposed, with a Burleigh-like shake of the head, to whisper, 'too ambitious'; and the applause of a few, together with that in-born gratification which makes such efforts their own exceeding great reward, is the only encouragement the pioneers in this yet comparatively untrodden walk of art receive. With our views of this subject, we hold failure in such attempts no shame, whilst we hail every success entire or partial, with unalloyed satisfaction.

The critic goes on to analyse the picture and show that the element of success is that the spirit of mystic solemnity which characterizes the poem is caught, and that the effect of the photograph, following the poem, is gloom, mischance, and sadness, together with an all-prevailing mysticism.

COMPOSITION. BY G. DAVISON.

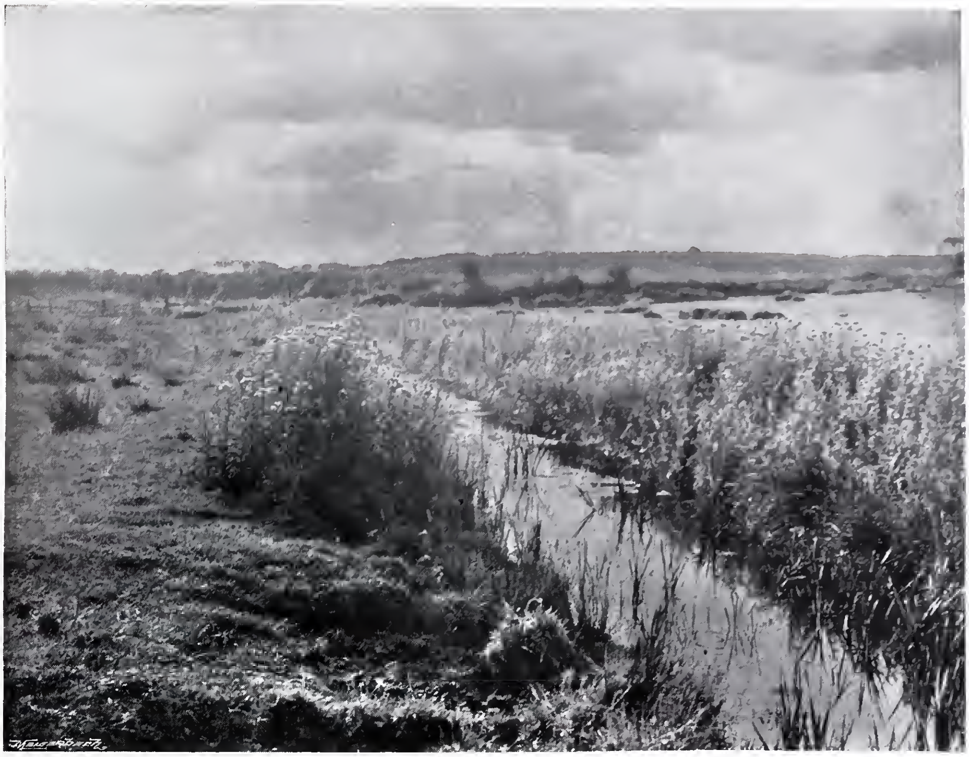
IV.

In any scheme of composition the particular characteristic which appears to come in for most frequent and confident criticism from the ordinary observer is the way in which the subject is presented as regards its boundaries. Every beginner in sketching or photography has his ideas about symmetrical disposition of lines, amount of foreground and sky, position of the principal object on the plate, and so forth. This may be the commencement of a strong feeling and understanding of decorative treatment, or it may be a rather mechanical application of a few directions out of a manual. In any case it is as different as possible from the fully cultivated sense of the beauty of related lines and arranged parts in the space of a picture, which is a very subtle perception and in its results finds appreciation only from the few. There is no limit to the variety of design possible, and there is a very distinctive kind of pleasure excited by the fitness with which the arrangement may equally fill the space and aid in telling the story. But some of the most effective and refined compositions in this way are, in the absence of conventional plan, or by reason of new and original treatment, a stumbling-block and an offence to the uninitiated.



EXAMPLE NO I.

Coming back to the more prosaic aspects of the subject, as applied to photographic work, it is evident that the photographer who shifts the position of his camera, and alters its height and point of direction with a view to getting something that he wants must be in some sense a



EXAMPLE NO. 2

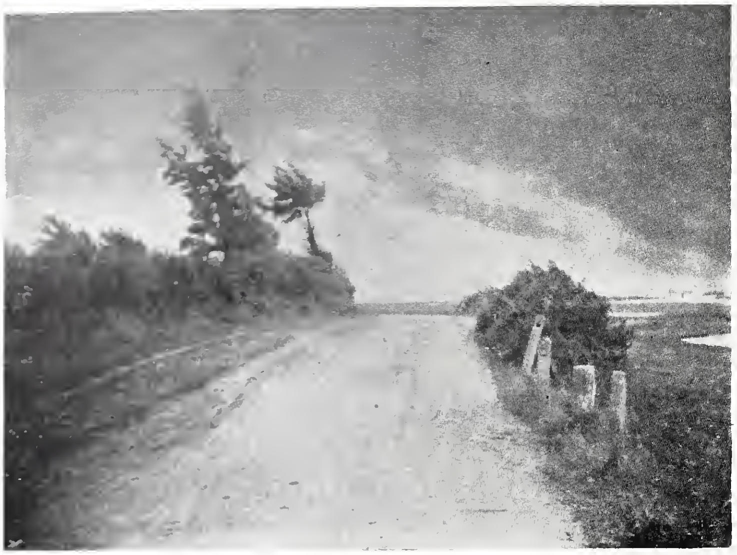
designer. That statement is contested, but we need not discuss it further here. We do not find picture limits ready applied in Nature. The field of view of our eyes with any one point of sight certainly has its boundaries, but these boundaries include space and facts which are far beyond what is possible of effective illusion on a flat surface. At least that has been the general feeling which has grown into an accepted rule. It leaves, however, very wide scope and we must use our own discretion as to the extents of the limits we should use in each case, and as to the relative disposition of the parts in those limits.

To insist upon any detailed rules of procedure in the selection and arrangement of subjects is to court absurdity and encourage the commonplace. The subject must, of course, be got upon the plate and effectively, but to insist upon strong points, to object universally to lines running out of the picture, to the division of the picture into equal parts, to a front or parallel perspective view, to the placing of the principal object in the middle of the picture, and so on, is to take away and forbid a selection which may be the very one required for a specific purpose, and to forget that motive and intention must rule the disposition in each individual case.

Amongst photographers there is no feature more criticized and perhaps misunderstood than the inclusion of much foreground and the use of high horizons or cutting away of sky. Witticisms are directed against spaces to let, and the humorist who is bound by some ignorant limitation as to the necessity for the sky-line being exactly two-thirds of the distance from top or bottom may miss altogether the purpose and intention of the arrangement.

Examine the matter first from what we may term a natural and optical standpoint In how many circumstances or positions do we not find the sense of the foreground very prominent or predominant in a view. It is so indeed, in almost every prospect seen from a standpoint on low ground or in level country. When the observer is upon a beach or in a small boat what is it of which the strongest or most evident impression is received by the eye, or of which at least the eye must of itself be most cognizant? Surely the expanse of beach or the wall of water. Let anyone try it and see how the foreground of sand or of water fills the eye to the exclusion of the sky above.

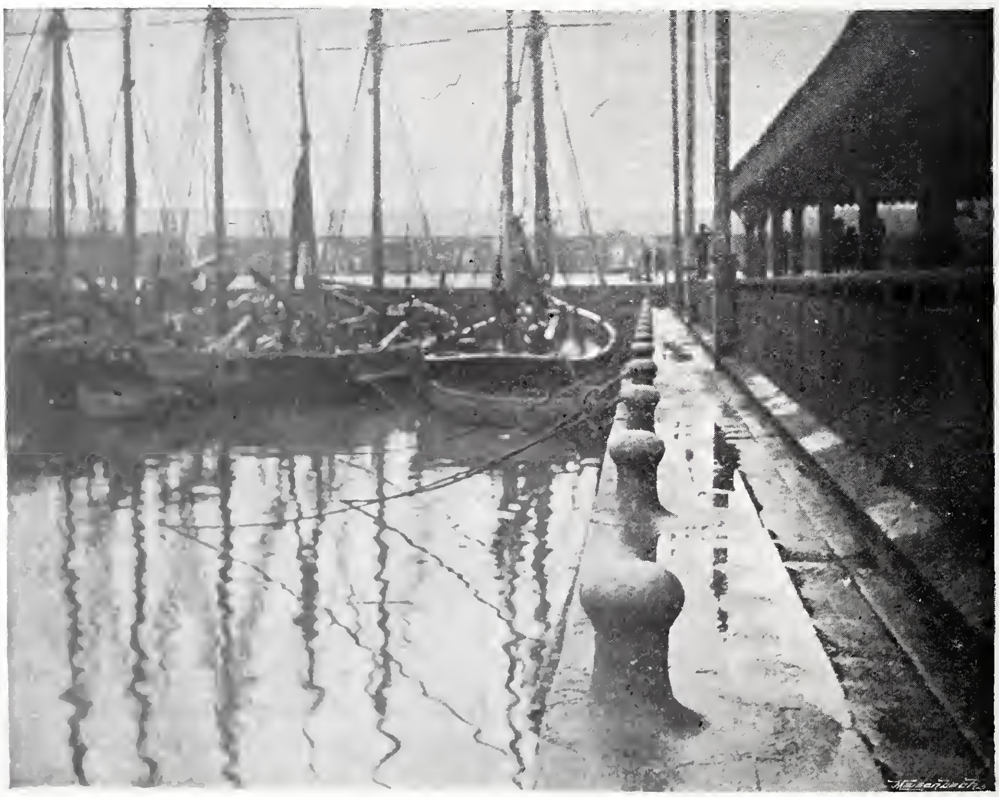
Of course, the head may be raised or a lofty standpoint selected, and special observation may be given to the sky or things above the horizon, in which case the foreground will not be much felt, but in the cases cited the normal position is understood and the sight is supposed to be attracted to a point on or near the horizon. In such a case there is no doubt but that there is a sense of expansive foreground and little impression of any sky much above the horizon. This is only natural, considering the proximity of the foreground. It thrusts itself into recognition. It may also be observed that the eye is more closed in above by eyebrows, and more open below with most people, and if



EXAMPLE NO. 3

only for safety and relief from glare the eyes have a tendency downwards rather than upwards.

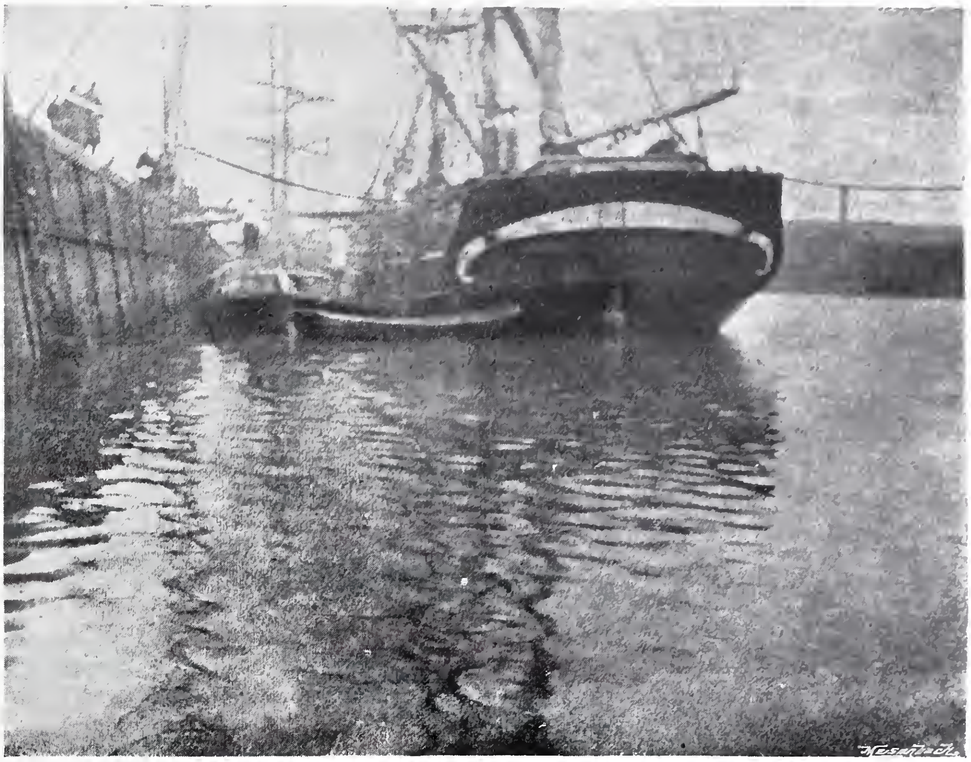
In the composition of artistic pictures, however, it is doubtful if much importance should be given to these considerations of how the eye sees, since, followed consistently, such an attitude soons leads to serious absurdities. It is the will that has to be reckoned with, the motive and intention, and the desired subject or principal object may lie in the foreground space or well above the sky line. For example, if it is desired to picture a group of fisher-folk close to the seashore from the same level a little distance away, the effect is best gained and interest concentrated in the group by an expansive foreground, and a cutting down of the sky space. Many other similar cases will occur to any observer. The question is—where does the interest lie, and where should attention be chiefly concentrated relatively to the rest of the picture? The only possible answer to these questions will bring us to the conclusion that everyone should be left free in working, and that the more mechanical operator should not hastily condemn unconventional treatments which may be the outcome of distinct intention, and of truer sight and more effective expression than he understands.



EXAMPLE NO. 4

There is another prejudice of a narrow sort which may be pilloried in connection with this subject, namely, the curious innocence and misconception sometimes displayed about shapes for pictures. For instance, some blind leaders of the blind say "never use round or cushion shaped corners, they are very inartistic," not, be it observed, when or why they are inartistic or in any particular instance, but universally. Again, "squares and circles should, whenever possible, be avoided," instead of, as it should be, "suit your shape boldly and cunningly to your subject, if you have any decorative intention, and despise no form."

The fact is, if a man be so disposed he can continuously and persistently seek and design



EXAMPLE NO. 5

only such subjects as would be best fitted by a round or a square exclusively. Never mind whether it be architecture or landscape, portrait or figure work, if the aim be pictorial, do not be bound by ignorant conventions. One shape is no more artistic than another in the abstract, it is in the individual application, and in cunning fitness that effect is produced.

Coming to the examples printed with these notes, No. 1, "The Hedger," is appended as an instance of a subject which seemed to come best in a form which happens to be almost square. As regards any other point in the illustration, the degree of diffusion would certainly cause some to blaspheme, but, with equal certainty, it takes off some of the stiffness and want of movement which is a defect of the posing in this instance.

As regards round pictures the portrait by Mr. Hollyer of Sir E. Burne Jones, the face in bold relief in a circular frame will be a well-remembered case as an effective and appropriate presentment.

In the second example, a ditch and thistles, the expansive foreground is not altogether happy, because of a distinct uphill appearance suggesting a downward look from a slight eminence. The hard straight line of the ditch does not improve matters, and the sky line, similar in character, only accentuates the objection, and they make together no very pleasing or fit disposition of the space. In the original this picture, as in some of the other examples, is a large 20 by 16 direct photograph, and these defects are there very plainly seen, as also the weakness in tone on the right-hand side of the print, both in a patchy sky and in the meadow. In the reproductions the tone relations of the originals are of course frequently upset and altered.

The third illustration shows in the original print much better harmony, and more distinctive intention. The amount of plain foreground rather helps to lead and concentrate attention to and upon the wind-blown trees seen against the stormy sky, which together constitute the effect aimed at.

Example No. 4 is again by no means a completely happy result, owing to unsuitable point of view, violent perspective, and to harshness and rigid disposition of some of the lines. Some further cutting away of the upper portion including sky and masts would have had the effect of concentrating attention more markedly upon the forms of the boats and the mast reflections.

In the fifth and last illustration the decorative treatment is far more effective than in any of the others. The graduation of the shadows into the reflections and the forms of these latter, together with those of the boats and vessel, make a not ineffective composition. The view is from a low landing stage, and shows fairly well what would be the normal natural view and impression in looking at the ships and their reflections from such a standpoint. The inclusion of much sky and masts would inevitably ruin what effect the composition has.

In concluding this series of notes and criticisms of examples I cannot do better than repeat that the best way of understanding the true meaning of composition is by work and study, by close and constant observation and experiment as well as by judicious examination of the productions of schools of past workers as a whole, of the collected works of individual artists and of separate pictures in such a way that, without binding one's practice to any rule or previous design, new ideas may form in the mind. Such a current of fresh ideas must, with earnest and constant work, inevitably show in one's compositions.

NATURALISTIC PHOTOGRAPHY. BY P. H. EMERSON, B.A., M.B. (CANTAB).

CHAPTER II.

(*Continued from Page 25.*)

One of the effects of my throwing the principal object slightly out of focus is to obtain a truer tonality. Spherical aberration of course affects the tone of the resulting image. It lowers it throughout and indiscriminately, and is, therefore, inartistic.

I doubt not but some curious studies could be made in the use of lenses uncorrected for spherical aberration. As has been said, we condemn all lenses with outstanding positive spherical aberration. What we want is an aplanatic lens, in a word, one corrected for all aberrations. These lenses are the triumph of optical science and are of various kinds.

Mr. Lake Price long ago said that the area of aperture of the lens was the very helm by which it was governed. This is so, given an aplanatic rectilinear lens.

Now, in choosing our lens we have to keep in mind the work for which it is intended.

There are times when we wish to use a quick lens, others when a big image of a distant object is important. Then we require long focus lenses. I think no one should use a lens including more than 40 degrees, and the focal length we think should be at least as long as the diagonal of the plate used, preferably twice the length of the base of the plate. In a specially constructed lens like the tele-photo this does not of course apply.

The student will find it advisable to have a quick-acting rectilinear portrait combination like the Dallmeyer D. lens. A rapid rectilinear giving wide angle, and longer focal length, and a set of long focus landscape lenses. I have four of these for use with my camera.

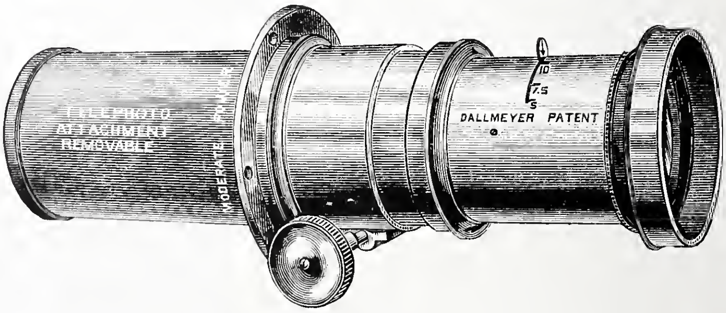
The wide angle landscape and wide angle rectilinear lens I consider undesirable, for if they are not to be used as wide angles, of what good are they? Though it is true that if you enlarge a portion of the picture it will be the same as that taken by a wide angle, still, the lens is more cumbersome than a long focus including the same angle.

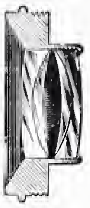
For example: Used on a 10-inch base a long focus landscape for 6½ x 8½ plate has a focal length of 12 inches, and includes an angle of 45 degrees, precisely the same angle and focal length as a 12 x 10 wide angle landscape gets in on the same plate.

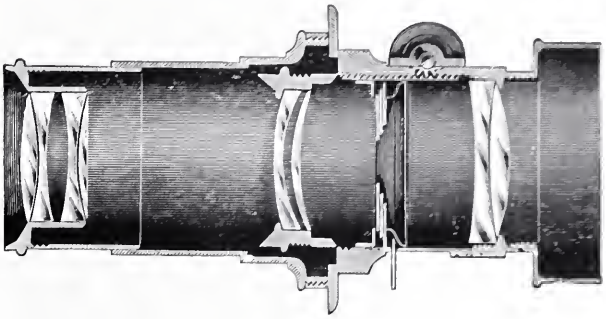
Personally, I prefer a battery of lenses varying in focal length from 12 to 35 inches, and including angles varying from 23½ degrees to 45 degrees, the base line of my plate being 10 inches.

The Telephotographic or Large Image Lens.

This lens is constructed for photographing near objects of large size or distant objects of relatively large dimensions with comparatively short camera extensions. In all lenses that we have hitherto dealt with, the optical center of the combination has been contained within the lens mount. In the telephotographic lens now under consideration, the entire system is positive in nature, forming a real image; its constituents are ordinarily a positive lens of which the focus is considerably longer than that of the negative component. It is evident that if the components were placed in close proximity the focus of the system would be negative and hence no real image would be formed. By proper adjustment, however, of the separation







between the two elements, a real image can be formed at any camera extension chosen. The shorter the extension the greater is the amount of subject (always a narrow angle) included upon the plate, and the greater the extension the less the amount included upon the same plate.

The greater the camera extension the longer is the corresponding equivalent focus.

This lens therefore has a great selective power, and is invaluable in composing pictures from its selective capability.

This lens differs in optical construction from ordinary positive systems, in that the optical center, or to be more precise, the nodal point from which the equivalent focus is measured lies outside and beyond the front combination. The result of this is that the novice is astounded at the large size of image that can be obtained at a comparative short extension of camera.

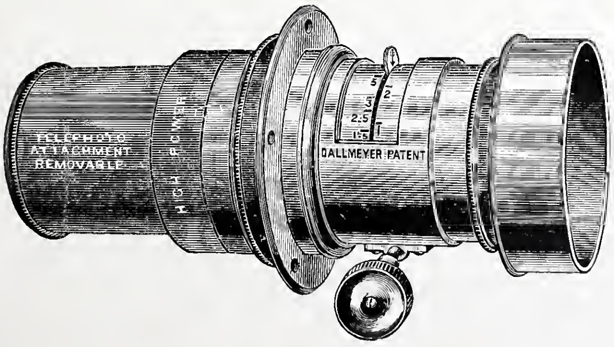
I am in the proud position, as it were, of being the godfather of this modern invention. In 1887 I asked Mr. Dallmeyer if such a lens could not be made, and he replied—no! Next in the autumn of '96, I again requested him to assist me in the construction of an instrument for the dual purpose of obtaining large images of small objects in natural history observations, as well as for photographing distances with truer rendering as regards perspective, and in a manner that should obviate the depressed and dwarfed rendering given by all ordinary photographic methods, and suggested that the ordinary telescope could be converted and arranged for such a purpose. This Mr. Dallmeyer very shortly accomplished, relying (as he has pointed out in a paper delivered before the Society of Arts) upon well known principles in the science of optics and as the history of the subject has shown he was the first to do so in a serious manner for photographic purposes, and improvement after improvement has followed the first design. Needless to say many others seeing the commercial value of such a construction followed in the wake, but we wish to place on record the true history of the origin of this valuable adjunct to the apparatus of the photographic world.

The original construction was of very great power or magnification, but Mr. Dallmeyer has subsequently introduced instruments of more moderate power. The high power systems include an angle of 12 to 15 degrees, and the later more moderate power from 18 to 20 degrees.

Before giving shortly details of the method of calculating the focus and intensity ratios of the telephotographic system, we must call photographers' attention to two very important factors in the employment of this instrument.

In the first place as we have already stated the optical center of the combination being outside and beyond the front combination, it will be evident that the slightest tremor in the camera itself will appear very much exaggerated in the resulting image as against using an ordinary camera, in which the optical center is contained within the lens itself for in the telephotographic lens we have practically to consider any slight movement in the camera itself as a movement of the short end of a lever, the indistinctness of the image being reckoned by the vibration or movement of the long arm of the lever (in our case the optical center situated outside the camera).

The other point to be taken into consideration is one that can only be arrived at by practical experience, and that is the very short exposures necessary for distant objects. In ordinary photography, we usually find without very careful development that the distance is "burnt out" if a full foreground development is required. No definite rule for reduction and exposure for distant objects can be set down but if the exposure is calculated according to intensity ratios, we shall be safe in stating that a reduction of one half to a third of that calculated in the ordinary manner may be given.



The simplest means for determining the corresponding foci and intensity ratios of a telephotographic system is by means of the ratio between the foci of the positive and negative elements. This ratio can always be determined, for example, if a six inch lens is combined with a three inch negative, the ratio is 2 to 1; if the six inch positive is combined with a two inch negative, the ratio is 3 to 1, and so on. If the distance between the diaphragm of the lens and the screen be measured and multiplied by the ratio as above stated, the result will be the equivalent focus of the system, and the intensity is simply this equivalent focus, divided by the clear aperture of the diaphragm employed. This rule is quite sufficiently accurate for all ordinary purposes, but we will add a further and exact mathematical rule, dependent upon the linear magnification of the image given by the positive lens alone.

Magnification—Divide distance from negative or posterior lens (after the image has been focused sharply) to focusing screen by the focus of the negative lens, and add one to the result.

Corresponding focus—Focus of positive lens multiplied by the magnification.

Intensity ratio—Intensity of positive divided by the magnification.

CHAPTER III.

DARK ROOM AND APPARATUS.

There is no need to despair if there be no dark room, no place to build one, no means to pay for one. Some of our most successful plates were developed in a scullery, and others in the bedroom of a house-boat. In fact, the sooner the student learns to develop anywhere, the better.

If a dark room be necessary, you cannot do better than build one as suggested by Captain Abney, in his "Treatise on Photography," modifying it to suit your taste and means. One thing, however, you should be careful about, and that is the ventilation, and money should not be spared on that department. The dark room can be scientifically ventilated by any good sanitary engineer. We have already, elsewhere, gone into the subject of ventilation of dark rooms, warning photographers of the pernicious effects of defective ventilation.* The best sinks are made of earthenware, as supplied by Doulton. The lamp should be large, and give a good light. Ruby glass is, to some, injurious to the eyesight, and has been known to produce nausea and vomiting, in which cases cathedral green and yellow glass should be added. The photographer will require at least eight dishes, and at the very start he should make it a rule never to use a dish save for one purpose. We consider the best dishes for all purposes, are made of granatine or ebonite. They should be bought in a nest, the smallest size taking the largest plate used by the operator, and the other seven increasing in size, so that one fits into the other. This makes them more convenient for carriage. The dishes should be distinguished by painting on their bottoms. One will be wanted for developing, one for the alum bath, one for the changing bath, one for the hyposulphite bath, one for an intensifying bath, leaving others over for odd jobs.

When it is remembered that hyposulphite of soda is so "searching" that it has been known to penetrate through the ordinary so-called "porcelain" dishes and crystallize on the outside, one may judge how important it is to keep a separate dish for each operation.

A light wooden board with a handle is most convenient for putting over the developing-dish, in the earlier stages of developing, especially when using orthochromatic plates, but the student must be careful to keep it on a shelf by itself. Another requisite is a broad brush of fine sable hair, say three inches broad, this had better be kept perfectly dry and clean in a box of its own.

The chemical solutions should be kept in bottles with glass stoppers, each bottle should have an enamelled label, so that it can be readily seen in the dark room and cannot be destroyed by acids. A zinc washing trough which holds two dozen plates must be procured. A simple wooden drainage rack is also necessary. We have tried several travelling lamps, and there are several good ones now on the market, of these we prefer the candle illuminated. Two measuring-glasses at least must be procured. It is as well to have one minim glass to hold sixty minims, and a large measure to take the full quantity of developer required for one plate. A pair of ordinary scales with weights (apothecaries'), costing a few shillings, will complete the list of apparatus required. A few simple printing frames will be wanted, one of which should be a size larger than the plate used. A square slab of glass, the size of the plate, and another a few inches larger each way, will be found the best for trimming prints upon. A razor or very sharp knife will be found the best tool for this purpose.

---

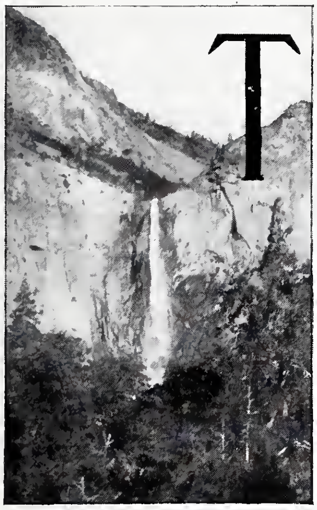
* "Ventilation of the Dark Room" and "Ammonia Poisoning" in the "Year Book of Photography and Photographic News Almanac" for 1886-87, and on "Pharyngitis and Photography" in the "Year Book of British Journal of Photography" for 1887.

Our student should get all these things of good quality, and set his face against the syrens who whisper in his ear that he ought to get this and ought to have that; he does not want anything more than we have told him, a greater number of things will only embarrass him. We are perfectly well aware that the most elaborate fittings have been put up by photographers, and we are equally aware that these have as yet not led to the production of a single picture.

(*To be continued.*)

PHOTOGRAPHING IN THE YOSEMITE.

BY WILLIAM D. MURPHY



TO the average amateur photographer the idea of a photographic trip in the Yosemite may seem ideal, but in reality, few of the many who undertake that journey return with satisfactory pictorial results, for the difficulties in way of successful photography in that beautiful valley are many and militate seriously against artistic triumphs with the camera. In the outset the remoteness of the spot, and the necessity for light luggage on the long stage journey, conspire against an adequate photographic outfit, and when going into unfamiliar territory under such circumstances the tourist is nearly sure to leave at home the very things most needful.

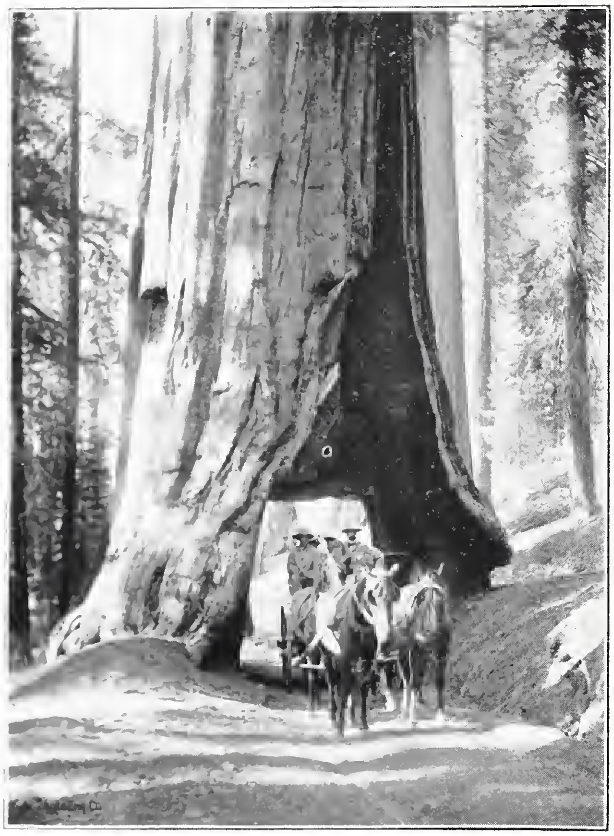
Plenty of plates and a variety of lenses are prime essentials, together with a camera of reasonable size, say 5 x 7 or 6½ x 8½. The writer was equipped with both of the above mentioned sizes, using roll film in the smaller, and glass plates in the larger box, with wide angle and long focus lenses for the latter; he having long ago learned that when the travelling amateur is forced to choose between clothing and photographic outfit, the raiment can best be dispensed with.

There is no denying the fact that the Yosemite is painfully remote, even after the long railway ride across the continent, it still seems a far cry from San Francisco to the famous valley, for two hundred miles of rail and seventy more of rough stage riding still intervene, and the less said about that stage ride the more numerous will be the future visitors to the valley.

THE THREE BROTHERS

Leaving San Francisco at 4 p.m, in a comfortable sleeper, the tourist is awakened at six o'clock in the morning at Raymond, where after a hurried breakfast at the Hotel Liedig, a house with a high sounding title, but with a primitive cuisine, he is bundled into one of Washburn's four horse stages and the real Yosemite trip begins.

The stage is a ponderous affair and the tourist often wonders why it is so heavily built, but before the noonday halt at the secluded little inn at Ahwahnee, this wonder will probably give way to a doubt that the wagon will outlast the wear and tear of the twenty miles of road that must be traversed before reaching Wawona, where the night is to be spent. Speaking of the stage the driver must not be neglected, for he is a man of the greatest importance, and is possessed of a skill with whip and rein that is really wonderful to behold. His influence with



" WAWONA "

the scattered settlers along the line is simply immense, as his power to do them daily favors in the way of imparting news and transporting neighborly gifts is practically unlimited. On one occasion he kindly carried a large cake of ice for a widow lady some twenty miles away, considerately packing it under the back seat of the stage, which was occupied by a Chinaman. This arrangement had a somewhat chilling effect upon the mongolian, and the ice melting steadily converted the floor of the vehicle into a rather damp resting place for the hand bags of the other passengers, but the widow got the ice, and no outspoken protests were made by anybody.

The Wawona House is a comfortable place situated in a pleasant little valley, which you take pleasure in observing as soon as the dust has been sufficiently brushed out of your eyes. Speaking of dust is not considered good manners in California in midsummer, but the tenderfoot is apt to comment upon it fervidly at times. Wawona is the headquarters of the Washburn family, represented by three affable brothers, who, armed with long feather dusters, meet each stage and welcome the arrivals.

The Washburns own the stage line and almost everything else in sight; some people think they would own the Mariposa Grove and the whole Yosemite, if a far-seeing government had not stepped in and established a reservation, securing the same by a deposit of U. S. cavalry.

The photographic tourist will find it worth while to spend a full day at Wawona in order to enjoy an excursion to the Big Trees of the Mariposa Grove, only six miles away, where such subjects as "The Grizzly Giant," ninety-three feet in circumference, "Andrew Johnson," the fallen tree, and "Wawona," with the tunnel through its trunk, will call for his best professional attention.

An early start must be taken the next morning, as the stage leaves at six o'clock in order to cover the remaining twenty odd miles by noon. This ride is a repetition of that of the day before over a rough dusty road, winding slowly up among the hills, and passing through the continuous forest of gigantic pines, which although measuring from six to twelve feet in diameter seem but slender saplings when contrasted with the fresh memories of the Mariposa Grove.

It is difficult to imagine a more sudden or surprising change of scene than that presented as the stage emerges from the dense timber

SENTINEL ROCKS

YOSEMITE FALLS

THE DOMES AND ROYAL ARCHES AND CLOUD'S REST

growth, and wheels out into the open at Inspiration point, where the first and grandest view of the Yosemite is obtained. Expressions of wonder rise to every lip, as without warning, the unparalleled view dawns upon the eye.

Like the setting of a mimic stage, with each scenic detail arranged to form a well balanced and harmonious whole, nature has here put forth her best endeavor to present a perfect picture.

Just what prehistoric convolutions produced this stupendous result may well be a matter of scientific contention, but to the simple tourist's eye it appears plain that a section of the rolling hills has been suddenly dropped down about three thousand feet, creating a valley, with nearly perpendicular walls, about one mile in width and eight or nine miles in length, and with a floor so level that when viewed from the height of Inspiration Point it looks as smooth as Parkland. Through the center winds the silvery ribbon of the Merced River, swiftly running but showing little trace of its wild plunge of seven hundred feet where it enters upon the scene under the title of the Nevada Falls. On the right is to be seen the beautiful fall of the

ANDREW JOHNSON

YOSEMITE FALLS

A BIG TREE

EL CAPITAN

Bridal Veil, a swaying wisp of dazzling lace nearly nine hundred feet in length, opposite "El Capitan" rears his massive front, three thousand feet of solid granite, while far in the distant center of the picture loom the "Domes" and the towering peak Cloud's Rest, rising to an elevation of nearly ten thousand feet. Within these narrow limits lie more scenic wonders than in any equal space on earth, and as we proceed down the winding trail and up the valley, each moment brings to sight some world famous feature to delight the eye and tempt the camera.

Three days spent in the valley will suffice for sight seeing, and the photographic purposes of the ordinary tourist, but, of course, a longer time is necessary if serious photography is contemplated. It takes time to really get the measure of the place, and the scale is so enormous that one is apt to lose sight of the fact that many of the least conspicuous features of the landscape are items well worthy of the best efforts of the artist.

Reference has been made to the difficulties in the way of successful photography in the Yosemite, which may be briefly summarized as coming under the heads of lighting and composition.

The dazzling reflective qualities of the whitish granite of the walls of the valley, together with their great height, which causes heavy shadows and too vigorous contrast of light and shade, forms an ever-changing series of complications tending to make the matter of exposure a difficult question for the amateur unfamiliar with the rare actinic properties of the clear California air.

Then there is the ever-present difficulty in obtaining the right point of view, which a careful inspection of the locality often proves to be at some inaccessible point where a goat could scarcely find footing. Many a Yosemite picture has been criticized by some outsider who has patronizingly said, "Yes, it would have been quite a good thing if the artist had moved back a few rods;" when in point of fact a backward movement of three feet would have resulted in a fall of a couple of thousand feet to an entirely different point of view in the valley below.

Within the limits of this sketchy outline of the photographic possibilities of the Yosemite

AT THE FOOT OF YOSEMITE FALLS

YOSEMITE FROM VALLEY VIEW

there is no room for a detailed description of the marvels of the valley, but the accompanying illustrations are submitted in testimony of what might have been accomplished by a more skilful camerist.

A SCHOOL OF PHOTOGRAPHY.

BY MILTON B. PUNNETT.

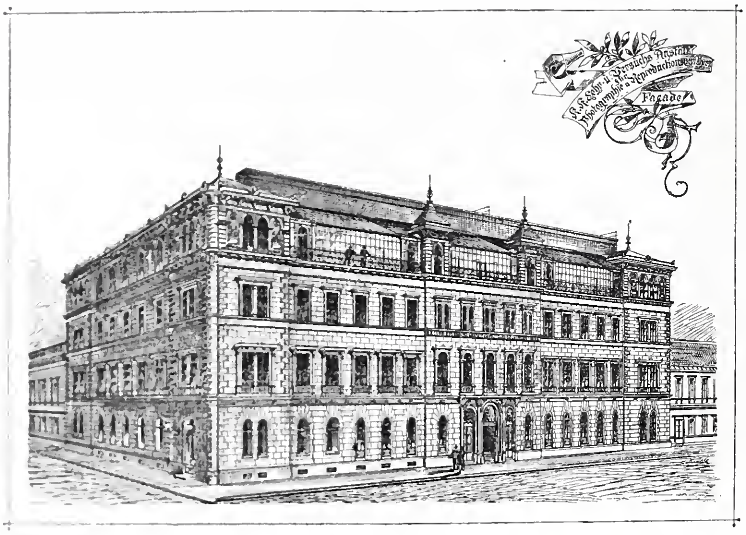
Less than a year ago one of New York's leading photographers expressed a wish in the columns of a well-known photographic magazine, for a "School of Photography," where a good knowledge of the art and science could be had at a nominal cost to the student. A letter addressed to the editor of the magazine asking him to use the influence of his journal in founding such a school received the reply that several private schools of photography had been started but had met with little encouragement, and, therefore, he did not think the time was ripe for such a movement. If the conclusion which this editor had arrived at, that because a school did not pay a good cash return on the investment or was not even self-supporting, therefore, the people did not desire it, was applied to the institutions of learning of this, or any other country, we would soon be back sitting on a limb, eating cocoanuts in company with our Darwinian ancestors. Especially are the scientific schools with their costly apparatus and chemicals non-selfsupporting. The application of photography to the other sciences has become so universal that it can no longer be looked upon as simply an art science and the recorder of man's vanities; and a school of photography with a competent faculty would not be patronized solely by professional photographers and their assistants, embryonic or full-fledged, but by the professors and students of other sciences seeking to learn the vices and virtues of their hand-maid in order to correctly interpret the results they obtain. Photography has its limitations, and the lack of knowledge of these limits causes the loss, each year, of thousands of dollars and much valuable time. What advantages would accrue to the current photographic literature from such a school? The answer to this can be had by considering the value and number of publications originating from the Imperial School of Photography in Vienna, Austria.

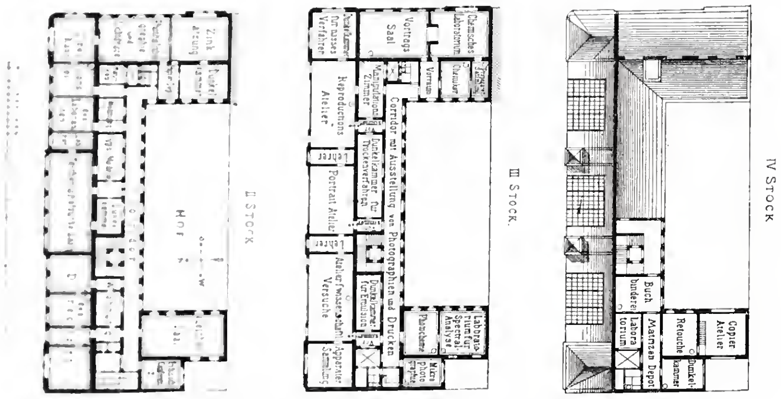
The record of the researches and opinions of Professor Dr. Eder, Professors Lainer, Kampmann, Valenta and the other members of the faculty of this school form for the earnest student and investigator, many a green isle in the ocean of trash, photographic absurdities, and chemical incongruities with which the photographic literature of to-day is padded. A consideration of the photographic schools of to-day would show that they could be separated into three classes.

First—Those not self-supporting, but being independent of any other college, fully equipped for teaching photography in all its branches and applications and encouraging original research among its faculty and students.

Second—Those not self-supporting but dependent upon a greater college for support and students. In some cases these schools may be fairly equipped, but quite often the professors are drawn from the faculty of the main college and make but a side issue of photography.

Third—Those founded and conducted on a business principle in order that they may prove a source of revenue to the investors. As it is the establishment of a school of the first-class we are advocating, we may confine ourselves to a short description of a truly representative one. The Imperial School of Photography of Vienna, Austria, or to give it its more comprehensive German name, "K. K. Lehr—und Versuchsranstalt für Photographie und Reproductionsverfahren" is with respect to situation, equipment, faculty, etc., a most excellent model. Located in one of the largest and most beautiful capital cities of Europe, within a few minutes' ride of picturesque streams and mountains, supported by the government, patronized by the royal family; directed by Professor


K. K. Lehr- u. Versuchs-Anstalt für Photographie u. Reproductionsverfahren
Façade



VIENNA SCHOOL OF PHOTOGRAPHY

Dr. Edey, the Humboldt and Macauley of photography, it is a credit to the science which it represents. The opening chapter of its catalogue informs the reader that the aim of the institution is to give thorough instruction in the most practical methods of photography and the other reproduction processes and their applications to the arts, industries, and sciences. The institute is divided into two departments, viz: "A" and "B."

"A" is the Department of Instruction.

"B" is the Department of Investigation and Original Research.

Department "A" is subdivided into five Departments.

1st.—Preparatory and Drawing Department.

2d.—First course in Photography and the Reproduction Processes.

3d.—Second course in Photography and the Reproduction Processes.

4th.—Special course in the various branches of the Reproduction Processes.

5th.—Practical Instruction in Photography for Amateurs (artists, scientists, etc.)

The purposes of Department "B" are as follows:

1st.—Original Research in the domain of Photography.

2d.—The Testing of Discoveries and new methods in Photography, Photo-Chemistry and the related sciences.

3d.—The Testing of Apparatus and Material at the request of individuals, firms, or institutes.

Lately there has been added to Department "A," a department for practical instruction in the making of books and illustrations.

To the fairly intelligent and diligent student a good foundation is offered in the following studies: Freehand and geometrical drawing; arithmetic applied to weights and measures, percentage and proportion; chemistry, organic and inorganic, with special study of the more important compounds used in photographic physics, especially the subject of optics, photochemistry, and photography, which includes the different positive and negative processes, posing, retouching, etc., methods of printing, half-tone, photogravures, lithographs, wood-cuts, etc. Most of the instruction to the upper classes is given in lectures. Lectures on the history and development of art and also a few on the copyright and other laws for the protection of the arts and artists.

The above short description of the curriculum does not embrace all that is taught but gives a fair idea. Professor Dr. Eder being the director of the institute is a sufficient guarantee for the capabilities of his subordinates. The tuition fees vary from $2 50 in the drawing department to $35.00 a year in the second course. The latter amount is for foreigners; natives of the Empire pay only $8.00, and this, through inability to pay, may be remitted. Of course such fees are nearly nominal—and add but comparatively little to the revenue of the school.

The accompanying sketch of the building, with plans of the second, third, and fourth floors which are occupied by the school, will aid the reader in comprehending its size and arrangement. Since these plans were made, room for the Book and Illustration Department has been acquired on the ground and first floors With this short sketch and a "God speed the mission of the school," let us leave Vienna and return to America.

For the establishment of a school worthy of the science of photography it is doubtful if the state or government can be depended upon, but once established and the wide spreading benefits of its mission apparent we think their aid could surely be obtained. Many a rich worshiper burns incense on the altar of photography, and surely when the need is recognized there will arise a Girard, a Cooper, a Cornell, or a Case. I repeat, it remains but for the want to be made known, to be published far and wide, and "the hour will find the man."

FAKING AND CONTROL IN PRINCIPLE AND PRACTICE.

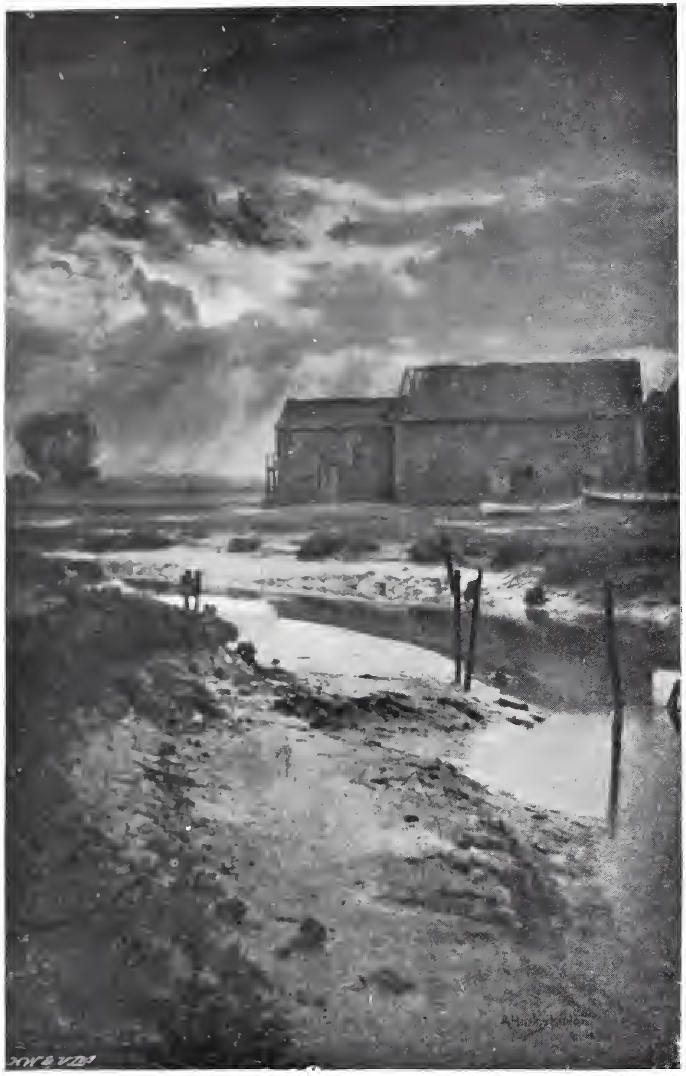
BY A. HORSLEY HINTON.

Editor The (English) *Amateur Photographer.*

I SHOULD like this article to be taken in connection with and as supplementary to a good deal that I have written before on the same subject ; that is to say, after having on several occasions spent many words in justification of what is known as "faking," when our object is to produce a picture and not a specimen of photography, my present purpose is to show to some extent how it is done, or, rather, to furnish one or two examples of what can be done in the somewhat automatic performances of negative and print towards the production of a very different effect than that which the unaided photograph from Nature would yield ; and yet this different effect is to be obtained by purely photographic means and without the introduction of direct hand work.

In the paper which I had the honor to read before the Photographic Convention at Yarmouth, and which was reprinted in all the photographic journals, I endeavored to show that even hand work, if it accomplished the desired end, might be justifiable within certain limits, but certainly such control as is found in "dodging" the printing, local development, intensification, etc., were merely variations in the process for definite purposes, and were in a sense hand work, or, at least, methods of controlling the result. In the October number of *The Artist*, using similar illustrations as those in the present article, I tried to convince readers who were less acquainted with practical photography that the so-called mechanical process of photography was capable of greater flexibility than is generally supposed.

The broad theory upon which I should start all such discussion is this, that the photographic printing process, such, for instance, as platinotype, gives us the power to produce all tones between the two extremes of black and white—no black-and-white artist can require more. Next, photography places in our hands perfect draughtsmanship, and that, by the way, at one single stroke and without elaborate training ; and then, which is more important, we can with care in printing alter any tone at will, making any portion darker or lighter at will, and if we carry this power yet further we can, by stopping locally the action of the light, alter forms, and may even obliterate offensive or undesirable parts. If, for instance, our photographs have in the foreground some undesirable object, as say an ugly figure, a group of cattle or sheep, which we feel it is imperative we should get rid of, there is nothing to prevent our blocking this portion out, and printing it as a white blank, and subsequently by a second operation printing into this white spot a piece of grass field or roadway from a separate negative. It *can* be done, it *is* done, I have done it myself, even to the extent of stopping out three or four individuals of a group of sheep, and printing-in subsequently from another part of the same negative a piece of grass field on which the herd was feeding, and in the finished print I could safely defy detection. Do we not often block-out a defective sky and print-in a totally different cloud effect from another negative? Do we not know, has it not become proverbial, that some prominent photographers leave a white blank in the midst of a rustic scene, and then from another negative "print-in" a figure or a group of figures ; has not this same combination printing become particularly identified with specially skilful photographers? May we not by the same methods omit an ugly tree or cottage, and print something else in its stead? May we not thus add something independently of wishing to leave out something else already there, and may we not leave out something without wishing to add any particular new object? So I claim that photography gives us the power to produce



COMPLETED WORK. "A DESERTED SHORE"

any tone, power to draw with faultless accuracy, and power to alter relative or actual tones, and finally power to omit or introduce other things which the unaided photograph does not possess. Of course the straight-away photograph may of itself be very satisfactory and pleasing, and yet though it may appear absolutely satisfying as a picture, still it must be remembered that it is merely a transcript of nature made by mechanical means, and possesses nothing which can be said to be directly derived from the producer. There must inevitably be an absence of individuality. This combination printing is by no means a new idea, but because its great apostle, Mr. H. P. Robinson, showed its utility chiefly, if not entirely, with respect to introducing figures into a landscape, no one seems to have thought of applying the principle in any other direction. The printing-in of a figure means the blocking out, the leaving out of a small region which that figure is to fill. Why then should we not leave out something our picture does not require, and print in just a portion of the surrounding scene, field or foliage, or whatever it may be, using combination printing for the purpose of leaving out instead of for introducing new matters, except such personal character as selection of subject may give, which is after all, largely a matter of rule and personal training? So that I feel that if photography is to possess individuality (that essential art of work) to any considerable extent it must be by controlling the print and introducing, obliterating, or modifying such portions of the automatically produced image as individual taste may dictate. When I say adding or deducting I do not mean necessarily adding or obliterating important and distinct objects, but adding perchance a region of shadow or a high light. I would not only justify a very liberal amount of "dodging" or control, but I would go so far as to say that the most seemingly perfect picture produced direct by photography would be the better for the expenditure of some personal control, and only when such personal control has been exercised can the production seriously lay claim to recognition as a work of art. But now let it be very clearly understood that I am speaking ONLY of such photography as has a pictorial aim in view. In ordinary photography, that is photography which is produced to show how far the mere process can go, then any assistance from the human hand, any exercise even of the mind beyond such intelligence as is required to work the process, is to be excluded as false and misleading. Once admit hand work even to the small extent of shading down or accentuating high lights, and the value and interest attached to photography disappear, and all confidence in its veracity is lost and it becomes proportionately valueless. It is only in pictorial photography that we need seek to impart to our work that pictorial essential individuality, which quality is only to be achieved by individual control of the work.

But now having advocated control, let us see how easily the less intelligent may overstep and abuse the liberty which this advocacy seeks to secure.

I have on many occasions attempted to show how, if the purpose of our photography be to produce a picture—a picture in the best sense of the word—we should use photographic means as far as they will fulfil our need, and then supplement them by such other means as our intelligence may suggest, admitting the while, if you like, that our knowledge of or skill in photography is imperfect, and hence needs supplementing by other means, but not certainly blaming the photographic process itself as incapable of doing with it all that we desired.

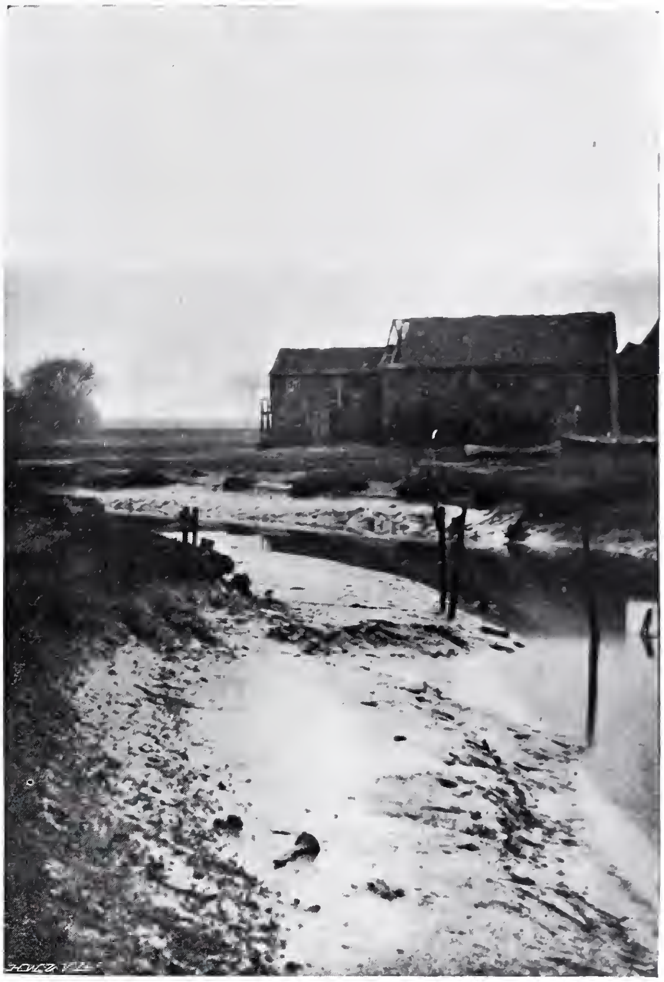
Compared with the photograph of but ten years ago, what can and is now produced is as widely different as our most ambitious ideals are different from the best productions of to-day. But now, in advocating in such cases the assistance of alien means commonly known as "faking," judging by the out come, I, and such as have agreed with me, seem to have but imperfectly expressed ourselves.

I should most distinctly claim that "faking" should be restricted to its not proclaiming itself by its appearing incongruous to the character of the photographic foundation, but from many examples of work one sees one is led to suppose that the producers are purblind, and cannot see the uniformity of the surface of their own productions, or else consider that a bit of the normally formed image and a bit of direct hand work mingled together so palpably as to attract notice at once is a matter of no importance.

I will still further try to explain what I feel to be the—if I may so call it—limitation of hand work in photography.

Firstly, I would submit that the purpose of *assisting* our photograph by direct hand work is to give additional effect, or, in other words, to emphasize some point, or else the opposite, namely, to suppress some portion.

In the first case it may be there are high lights we would seek to strengthen, and we do it by adding pencil marks or paint to the negative; or we wish to deepen certain shadows, in which case we either make a transparent positive and work on that, then making a final negative which will include our hand work, and the print, therefrom, will hardly reveal what has been done. Such courses may be called giving *emphasis* to certain portions.



TRIAL PRINT NO. 1. "A DESERTED"

Under the same heading comes the practice of "dodging" in printing, keeping back the light here, or shading down there, and by such tricks elevating or lowering various regions.

How far now may these practices be carried? *Just so far as the adoption of such practices does not make itself seen and does not betray itself.*

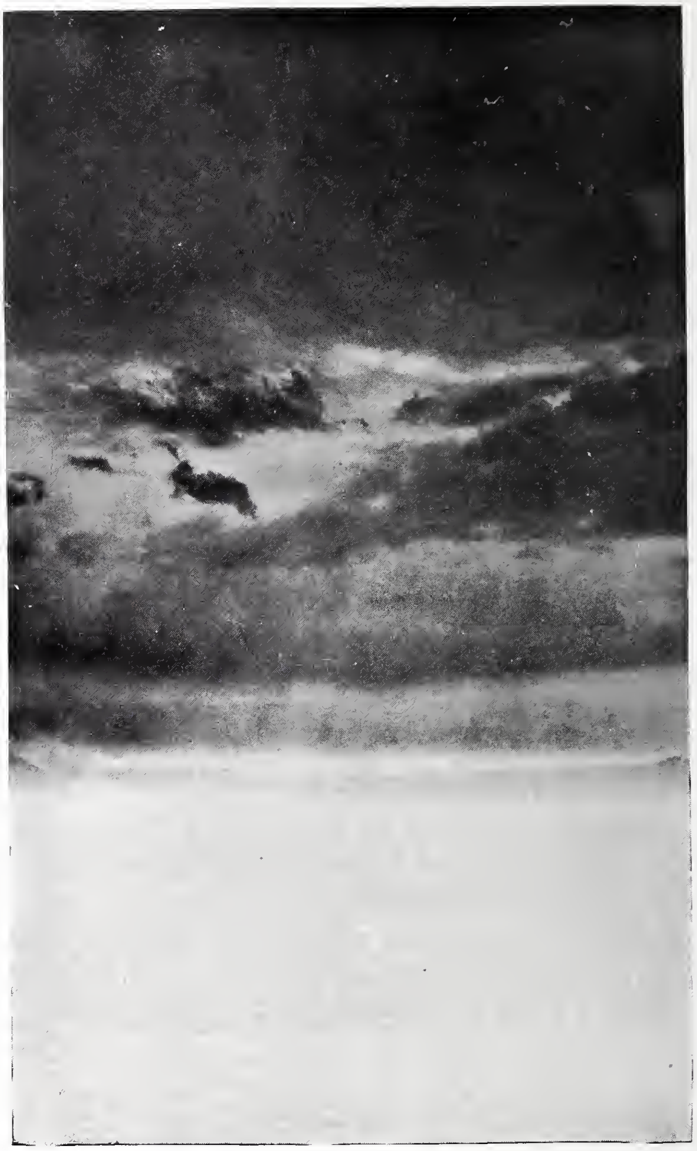
Having justified the principle of controlling the result, of course I do not mean that it must cease before it betrays itself *because* of the fear of being found out but for the following reasons.

Emphasis is exaggeration; that is to say, it is the increasing or reduction of certain parts in order to make the intention of the whole more distinct. Thus, if we have a marine or lake scene in which the reflection of the setting sun makes a luminous path across the water, if we with pencil or brush strengthen those little glinting lights and make them lighter in the print than the unaided photograph gave them, it is merely in order to heighten the effect and leave no room for doubt that light on the water is intended, or else to attract specially to that feature. In either case it is emphasizing or exaggerating something for a given purpose.

To do this is the privilege of art. In rhetoric, certain words are emphasized; in histrionic art, certain gestures are exaggerated; in music *andante* or *allegro* movements, *forte* or *piano*, are but forms of emphasis or expression; in painting, single forms, lights, and shades are exaggerated, or their surroundings are repressed, which comes to the same thing.

If one is telling a story and wishes to convey a very vivid idea, one, so to speak, colors the story a little highly, one exaggerates by ever so little perhaps some facts in order to emphasize the idea we wish to convey.

Under all these conditions we may regard exaggeration merely as a picturesque manner of telling or doing a thing, and so long as belief in the actual details and facts is not important, and no other action is likely to depend upon a belief in their accuracy, such picturesque manner of conveying a leading thought is justifiable and very entertaining. But if we go beyond certain limits, and the exaggeration which is to give emphasis to certain ideas or impressions is recognized as exaggeration, its recognition is at once its own undoing, and the narrative is no longer listened to, its value and interest and command of one's attention are gone, because we see through the exaggeration, and see, or at least suspect, a lie.



TRIAL PRINT NO. 2. "A DESERTED SHORE"

Apply this principle to our photograph and I think it will fit.

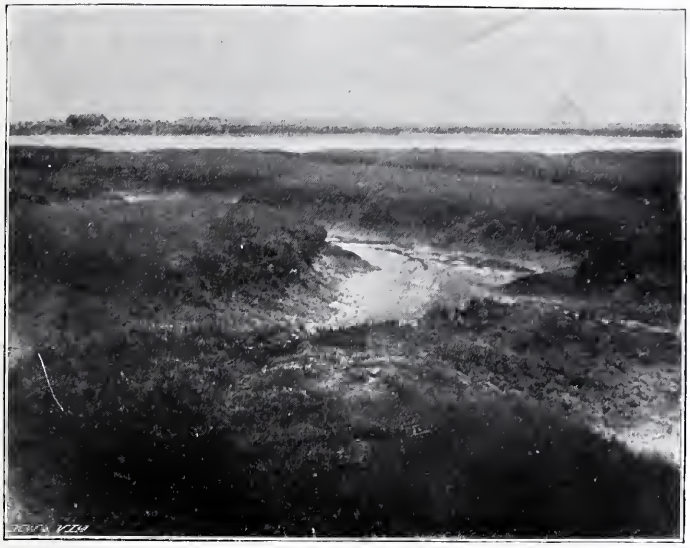
If by over-reducing in tone any portion or over-accentuating a light, the fact that reducing or heightening has taken place betrays itself, we at once resent the attempt to impress us as untruthful. We see through the exaggeration, and recognize the lie which is being passed off upon us, and it is too much to ask anyone to forgive it, even with the excuse that it was evidently intended to impress such and such ideas, and so we must forgive the clumsy falsehood.

Let excessive and vulgar "expression" be given in music, and we at once say it is affectation, and feel it to be *false*; *too much* theatrical action on the stage or elsewhere becomes ludicrous, we feel it is not in keeping with a true rendering of character or passion, and feel it to be *false*.

It is only another interpretation of the old rule that good art conceals the means by which it is done. Once let the means betray themselves, or once let it be felt that any particular means at all have been employed, and we shall have our suspicions as to possible inaccuracies awakened.

Such is briefly the limit I would fix for "faking" or hand work, and such the reason for so fixing it, not necessarily that direct hand work should step in to make the photograph more truthful to Nature, but that it should *seem more* truthful, which is by no means the same thing.

Poetic, artistic, picturesque expressions abound in such justifiable exaggerations, which *appear more truthful to Nature than truth itself.*



“WESTWARD,” PRELIMINARY PRINT

Suppose we photograph a group of mountains, probably most of us know how disappointing is the print, our lofty towering peaks have come to look like mere molehills; and yet that photograph is absolutely true. Had we the power to exaggerate the mountains, and used it, we should give a more truthful idea by our picture than the absolutely true unexaggerated record. If now we paint on our photograph, and make those mountains higher and larger by clumsy brush work which is at once noticeable, the observer sees at once that something has been added, and having made the discovery, instinctively rejects the imposition.

So soon as our “faking” gives falsehood instead of exaggeration it is wrong, but where the one begins and the other ends is not easy to say, and probably each one must decide for himself, and in his discernment, discretion, and selfrestraint in ceasing within the utmost limit will perhaps exist the *metier* of his artistic ability. The corollary of this is that when our “faking” is self proclaimed and readily detected it is because it is false, *and has exceeded that exaggeration or lesser falsity which would give the impression of truth.*

I am by no means sure that I have made this clear to all my readers. If you watch the sun rise over the sea, and take out the smallest English silver coin and hold it a little distance from your eye, you will find how relatively small the sun seems. If you tell of the sun rising out of the sea like a little threepenny-piece you are telling the truth, but you quite fail to give anyone the feeling with which that sunrise impressed you. So you put it picturesquely, and say that the sun rose like a great ball from the sea, which, though an exaggeration, gives a truer idea than truth itself; but if you paint that picture of sunrise, and in your enthusiasm represent the sun over-large, that is, if you over-emphasize your prevailing thought, the exaggeration is detected and affects the spectator so that he fails to get any of the enjoyment out of the picture which you intended to convey. This principle is not to be taken only as applying to size of objects, but more particularly to the discreet exaggeration of light and shade.

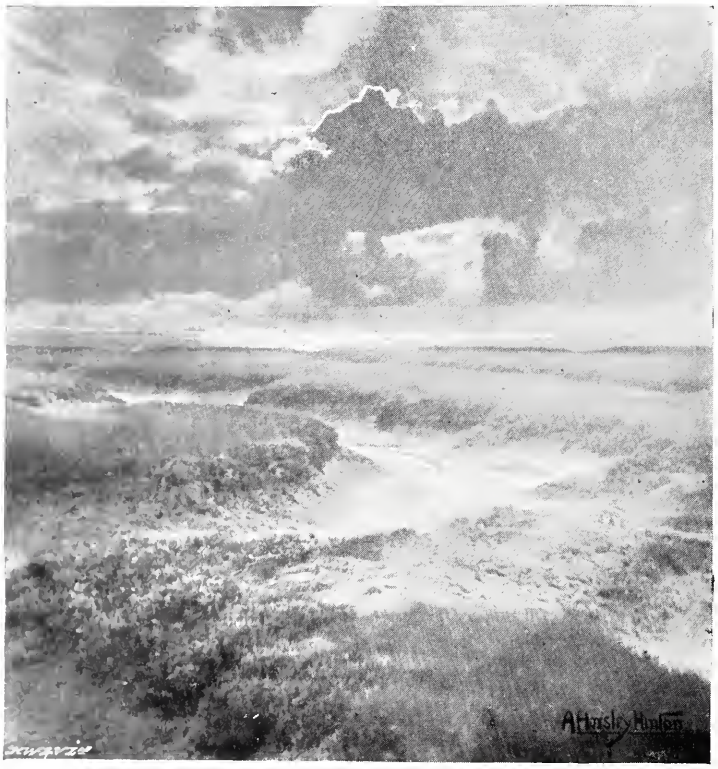
But I must leave this matter here, because I want to refer to certain instances of control exercised over the production of the photograph in which the alien methods called into use are of such a kind that I think even the strongest opponents to “faking” could hardly deny their legitimacy, and I think that these simple methods which I will describe point to possibilities of almost unlimited control being exercised which may go far to emancipate photography from its supposed purely mechanical nature.

I would not deny the photographer the use of any auxiliary means, *provided he can employ them so as not to destroy conviction by their too visible presence, and if the photographer finds their use essential.* But are brush and pencil

PRELIMINARY PRINT OF CLOUDS

on negative or print to produce any really important alteration essential? We will see.

Much more forcible examples of what can be done might without doubt have been chosen as illustrations, but those here given may suffice for the present; moreover it must be borne in mind that any method which has enabled us to make a slight difference in the print might, in most cases at least, be persisted in to produce very great differences, but often a very little alteration is all that is needed to impart the desired feeling to the picture, or to give *emphasis*, whilst too much would betray itself and create falsity.



"WESTWARD."—FINISHED PICTURE

NOTE.—*The white line on the horizon is much exaggerated in the reproduction, and is only faintly suggested in the original*

Now, will my reader carefully study the reproduction of "A Deserted Shore" on page 362, and compare the lower portion with the part of *Trial Print No. 1 marked A?*

In Trial Print No. 1 we have a 15 by 12 negative, printed without dodging on to a piece of paper about 19 in. by 12 in., the upper portion being covered with opaque paper whilst the lower was printing. It may here be noted in passing that the sky portion of the negative being thin has slightly printed through, and will be seen as a darker tint than the upper portion of the paper, which has been covered with opaque paper. I shall refer to this matter later.

To begin with, then, the subject being chosen on account of its pleasing composition and its nice distribution of masses of light and shade, it was duly photographed, an isochromatic plate being used with a rather deep yellow screen. The time was just after sunset; the sky being quite cloudless and of that almost indescribable gray-blue paling into green and yellow towards the horizon which so often follows the descent of the sun on a still summer's evening.

Having secured what one might call a preliminary sketch or study of the scene, I visited the spot frequently, making myself familiar with it under various conditions, finally deciding the conditions of light and atmosphere under which it pleased me most—*the conditions in which, as it seemed to me, the subject and the place conveyed most expressively the sentiments which hung around it by associations of the long past.* Now let it be noticed that I had a simple bald *negative of the place of the most commonplace kind, and I determined to use this in such a way as would convey certain feelings and ideas afterwards decided upon.*

First, I sought for the kind of cloud effect I thought I wanted, and after waiting some three or four months, always watching the changing clouds with this subject and idea in my mind, I encountered, when photographing many miles away, the kind of cloud which I thought, *with modifications*, would serve my purpose; it was not just right, but I saw that it was of a kind that I could alter and use. The result was the cloud negative shown in *Trial Print No. 2.*

Here then were the material elements out of which I determined to build up my picture. Now if you will refer to the completed print, entitled "A Deserted Shore," and compare both the landscape portion and the sky portion respectively with the two trial prints, you will see just where the modifications have been made—trifling differences perhaps, but without them the finished picture would not be so acceptable, full of error though it may still be.

First of all the cloud was adjusted to the landscape, and written notes made: then the landscape portion was printed. The old boat-houses, which came too dark in the unrestrained print were covered for a short time during printing, so as to cause them to print less deeply; also the form of the tree in the middle distance did not satisfy me, and so with some scraps of paper I shaped that tree differently. The brightly lighted portion of water and bank near the center were also kept back by covering during printing; and when all this was done and I thought it finished, the print was removed from the negative, and the cloud negative brought into use.

Now the same procedure was resorted to, the little black detached cloud was covered with a bit of cotton wool so as to keep it from printing too deeply, and the clouds just above it were lightened and broken up by similar means, the descending rays or shafts of light were "assisted" by strips of paper carefully adjusted; in short, hardly any portion of the cloud negative was left quite alone to work its own will. *This is what I call control* in printing, a very tedious, nerve-straining, patience-trying task, yet I think worth doing. The size of the print was 22 in. by 14½ in., and although it took two whole days to produce, dodging first this and then that part, I did not consider the time ill-spent.

(To put it on a very mercenary basis, the sale of, say, three copies at five guineas each, might be sufficient to convince some people that such work has a possible material reward.)

Having at length succeeded in getting the cloud as I wanted it, I next pinned the whole print on to a board and covered it with a sheet of stout brown paper. Then referring to the trial print No. 1, I raised one corner, then the entire end, and so tinted down the foreground—compare the foreground of the completed print and that of the trial print No. 1, and you will see what was done, my object being to concentrate the light on the central high light. Next the left and right edges of the lower portion were toned down in a similar manner. Then I found a little light patch had been left where the clouds had not been brought correctly down to the roofs of the boat sheds; to correct this was a delicate task—the whole print was carefully covered and only just the small light patch exposed to light without a negative for a few seconds. Then the print was held up in a subdued light and every part carefully examined to see if anything had escaped attention, and finally the print was developed; for remember this was a platinotype print—C C paper—and many of the lighter tones were hardly visible and had to be estimated.

My object in all this was that I had felt that those disused and ruined boat sheds, the forsaken shore—where once doubtless was a scene of maritime activity—and the channel choked with sand mud accumulated during many years, did not so powerfully convey the idea of their old-world romance, the stern solemnity which their association with the ancient Norse navigators lent them, when seen under a bright sunshine. I wanted the riven storm cloud, the glancing ray of keen light, shadow and mystery—also I felt that a better pictorial composition could be made by shading down light portions near the edge of the print; and all this I tried to accomplish from certain elements, from simple negatives which without control would never have yielded it.

Now turn for a moment to the set of three prints shown on the present page. Notice that No. 1 has in the distance an ugly straight dark band from one side to the other, the opposite bank of the river, and which in the photograph is darker and more offensive than in the reproduction.

This was quite intolerable, but the form of the foreground pleased me, so I found my suitable cloud, a sunset cloud (*although the landscape was taken during the afternoon*), and then I printed the landscape, with a strip of paper covering the objectionable distance, then introduced the clouds, and by careful shading, instead of looking across the marshes southward towards London, I endeavor to convey the idea of looking westward over a sunlit sea. Certain portions of the foreground have been modified, kept back in printing, or toned down. Little glinting lights I have tried to introduce on the bit of winding water in the center by placing tiny scraps of paper on the negative during printing.

Now please notice all this dodging is done by *either intercepting or introducing light; no paint, pencil, or such direct hand work has been used.* Is it photography? Is it drawing or painting by light?

On that memorable occasion, a Camera Club conference, it was, when Capt. Abney in bitter terms disparaged hand work in photography and coined the word "photo-faking," and condemned the practice. He defined good photography as "painting by means of light."

Well, which think you is most like painting with light? Placing a negative in a frame and letting the light work its will automatically and uncontrolled, or taking as it were a sheaf of pencils of light and directing their course, producing a tint here and a deeper shadow there, stopping their action in one place or letting them play on the sensitive surface for just a little while? With a ray of precious sunlight thus handled as a brush, do we not more nearly approach the act of painting, and so fulfil the literal meaning of the word photography—to draw or to paint by light? And yet there are many who ridicule the idea, and say contemptuously, "I don't call that photography; that is only 'faking'!"

In my next article I will describe a method of printing with platinotype or other paper, in which the examination of the print under control is more easy than when in a printing frame. I have been led by my own requirements to abandon printing frames altogether, and I will describe how by the substitution of other home-made or ready-made appliances, a print nearly double the size of the negative used can easily be made without enlargement of that negative. —*The Amateur Photographer* (*British.*)

LATITUDE OF THE PLATE.

On this subject Mr. Cadett has the following interesting remarks in *Dry Plates:* The question of latitude in a plate is one of far more importance than the average student of photography thinks; we often hear some of the better informed photographers remark that the quality of a wet-plate negative has never been surpassed by that of the modern dry plate. A few enthusiastic dry-plate workers who have never worked the wet-plate process, often say that there is greater softness and delicacy about a dry-plate negative than there is in a wet plate one. They even go so far as to say that the quality of negative produced by a rapid plate is better than that by a slow one; and there are some dry-plate workers who are even so ignorant as to say that such and such a plate is as "hard as nails" and lacking in gradation. Those who know better smile at the utter falseness of these statements, which are based upon pure ignorance. No plate is hard; our most delicate transparencies and negatives are often made upon plates having the highest development factor. These few remarks may seem somewhat of a digression from the subject of this article, but the question of the development factor in a plate is more closely bound with that of latitude than at first sight seems apparent. Theoretically, the question might be asked, even of an experienced scientific photographer, whether a slow plate had more latitude than a quick one, and he would hesitate, from a theoretical point of view, before answering this question; from a practical one, however, there would be no hesitation in the answer, because within certain limits a certain development factor is necessary for proper printing value, and the slow plate has the enormous advantage of giving this printing density with a minimum of development, and in consequence less actual depth of action in the film by the developer before that printing density is produced. I was led to pen these few lines owing to the immense surprise, to say nothing of the instruction, I received from examining some negatives taken by Mr. Vero C. Driffield, of Hurter & Driffield fame. Mr. Driffield put into my hands a plate with two negatives upon it; he also handed me two prints from these same negatives, and asked me what had taken place. Now, while professing to know a thing or two about negatives, I looked upon those he handed to me with very grave doubts in my mind as to how they had been produced, and it needed his explanation to make me understand what he had done. These two negatives being taken on the one plate, were developed together for the same time; consequently, the development factor (as those who have had anything to do with the Hurter & Driffield system will understand) was the same for both negatives. One negative seemed a perfect one both in exposure and density, but the other looked so dense that it could be scarcely seen through; indeed, it looked a perfectly useless negative to the untrained one, and yet the development factor, as we said before, was the same in both negatives, the result being that the prints from each negative were identical in every respect as far as the most critical observation of the eye could discern. Mr. Driffield then explained to me that one negative had received one second exposure and the other one fifty seconds exposure, and yet gave identical prints in every respect, the only difference in the working of these two negatives being that one required an enormous time for printing. Within the period of correct exposure the opacity is proportional to the exposure (it is necessary here to say by opacity we do not mean density or deposit

AU SOLEIL. BY C. PUYO

of silver, which Messrs. Hurter & Driffield say is proportional to the logarithm of the exposure), consequently, one negative had fifty times the opacity of the other, having had fifty times the exposure. Now, what did this mean? It meant that with the exception of a lengthened time of printing, it was perfectly immaterial whether that plate had one second or fifty seconds exposure, and this we must understand without any alteration of the developer or time of development, both negatives being exposed and developed exactly for the same time. Here was a state of things that seemed simply astounding; but upon making a speed curve of this plate the surprise was met by a very simple explanation, which was merely this, that for the developing factor given, the straight line portion of the curve, or correct period of exposure, was so long, and embraced such a wide difference of opacity, that the limits we could obtain on an "Ordinary" print, say, roughly, within one to thirty, could be made with such a plate fifty times over.

Of course, it is well recognized now that enormous differences can be made in a plate by altering the developer; but the widest limits in practice may be fairly said to be embraced within six to one: and yet we are face to face here with the differences obtained merely by the latitude of a plate of fifty to one. Now, needless to say, this plate was an extremely slow plate, such as would be used for photomechanical purposes, well coated and very slow. As we advance in speed we find the practical latitude of the plate fall enormously, until at last, by increasing the speed, we find, within the limits of the range that any printing paper will give, we have no latitude left at all: and the plate must have exact exposure if we are to get a good negative. Now why is this? There is one point which bears very forcibly upon this matter; some time ago, in trying to ascertain the effects of time of development upon a plate (especially using a rapid one), I found that in giving one minute of development, I obtained with the rapid plate from five to six

THE COMING SHOWER BY L. G. BRENGLE

points within the so-called period of correct exposure. Upon increasing the time of development with the same developer, two, three, four, there was a corresponding reduction in the number of points within which the straight line of the curve could be kept, and this of course was easy to understand. In a rapid plate we are obliged to develop for a certain time in order to get sufficient density, or rather we should say *opacity*, of image in order to yield a good print. Now rapid plates for the same developer and time of development have very much less powers of giving opacity, consequently, we are obliged, as it were, to force development for such a time that the action of the developer goes right through the film, with the result that there is not sufficient silver to act upon in order to keep up the regular density factor, giving arithmetical deposits of silver with a geometrical progression of time of exposure. Now with a slow plate with the same developer we reach this printing density when the developer has acted for a very short time on the film, simply because the deposit on a film of fine grain is very much more opaque than that produced on a film with a coarse grain, and it is this ease of getting density on the slow plates which allows us to practically stop development long before it has reached the same depth of film that would be necessary in the case of a quicker plate. It is really wonderful to note the fall in opacity-giving power as the plate is made more and more rapid. We cannot say that theoretically the latitude is greater in one plate than the other, provided that opacity of image be not taken into account; but for a given opacity the latitude is enormously different in comparison between the slow plate and the quick one. This, therefore, gives us a far greater latitude, to say nothing of better quality, in the slow plate than we have in the fast one. In every case where the term hardness is used to a negative it simply means that the developing factor is too high, and no matter however great the opacity-giving powers of a plate may be, this opacity may be made as soft and delicate, as we wish by stopping development or modifying the developer, and, therefore, considering the fineness of grain in the slow plate, we have the power of making pictures of the greatest delicacy as well as the greatest opacity, whichever we may desire to do. It is not to our interest to decry the value of quick plates; indeed, we, as the pioneers of speed, have no interest in saying a word against fast plates, but we wish to speak justly and give each kind of plate the merits as well as the demerits it deserves. Therefore, where we want great latitude and fine quality, the slow plate is unquestionably the better one, the question of gradation has nothing to do with the matter at all; provided that we expose the quick plate with the right exposure, and give it the proper development in order to obtain printing density, we shall get a result in actual gradation not inferior to that possessed by the slower plate; but exactness in exposure becomes of great moment in the case of the quicker plate, for we have less latitude, and, therefore, for quick work we require shutters and exposure meters which may be adjusted with absolute exactness. The advantages of high speed are so great in practice that the constant aim of the plate-maker must be to produce the greatest possible density-giving powers in a plate combined with speed. This has always been our strenuous endeavor, and one in which we certainly have been successful. At the same time the fact still remains that without alteration of development a very slow photo-mechanical plate can be made having quite easily a range of fifty to one, whereas some of our very highest speeds we have obtained will only give a latitude of one to one and a quarter, and by still further increasing the speed we may even make the range of the negative less, in striving for a given printing density, than the range obtained upon the print. As soon as the range of a plate equals that of the print, latitude is nought; and if we fall below this it is impossible to give a correct rendering of any subject embracing the total range of printing papers. I can assure my readers that already some rapid plates in the market have fallen below this range, and it means that such plates possess no latitude whatever, and are even incapable of representing the range obtained in printing papers. The plate-maker must never let his plate fall below this point, and even if he approach it the difficulty of getting a good negative is far greater for want of that valuable latitude. So important do I consider the consideration of this question that I would urge the photographic student to seriously consider it.

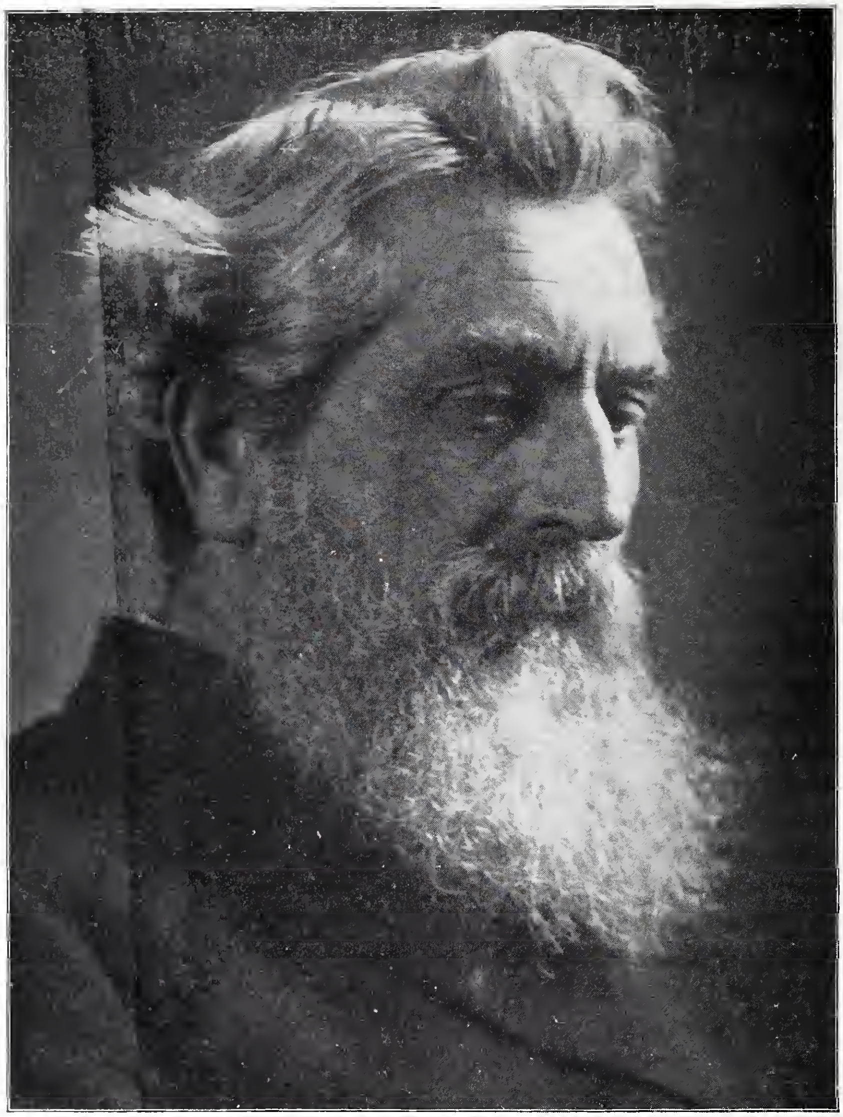
PERSONALITY IN THE PORTRAIT. BY J. REES.

Why should the contrast of expression upon the face of the photographer's customer going into, and coming out of, the studio be often-times so marked? And also be reversed, say, to that of the patient going into, and coming out of, the dentist's surgery? In the latter, the ultimate, cheerful, beaming benignancy is clearly due to anticipated pain passed well through; can it be in the former, on the other hand, that anticipated pleasure has been turned into—well, if not pain, something having a strong family resemblance, if the assured, smiling confidence of the entry, altered into the sulky and bored limpness of the departure, be any indication?

I fancy the explanation must be in the tedious and trivial treatment he has been subjected to, and the fashion in which his own individuality has been so completely sunk; owing, he tells himself—though with anything but pleasure—to the limits and needs of the technicalities of the process. The items, in the shape of arms and legs, that help physically to make him up, have been particularly arranged to suit, not his convenience and comfort, but the particular powers of a lens; his head turned into an uncomfortable position so as to be properly lighted; he has been told to look at a special spot upon the side wall for the due bringing out of expression in the eye or eyes; and, finally, had to keep his strained position and gaze in as statuesque a way as possible, until the operater saw fit to press the bulb, or uncap the lens—the which, by the way, he was not, either, in any particular haste to do.

Had the result justified all this fuss, there would be no need of saying anything further; but it hasn't. The submitted proof, it must be admitted, is all right as far as it goes—that is, as far as the good, orthodox photograph goes; but where is the sparkle of life and suggestion of individuality we would so much like to see?

Something must inevitably be lost in the attempt to represent life by means of a machine—the limits of photography be duly recognized; but are those limits, in ordinary use, true and natural ones, or they more or less arbitrary, accepted as classical, partly from having been handed down in practice from past workers, partly from the fact that sufficient experiment has not been made towards their bettering or supplanting by others more elastic and artistic? Past workers in their day turned out good work, for that day, and when, probably, novelty was a material factor to help in a not over-critical judgment of the result. But things are different now, and I contend that advance in this particular direction of portraiture has not kept pace with our increased and improved general photographic powers; and doubtless has a great deal to do with the general complaint of low and insufficient prices so prevalent at present.



STUDY OF A HEAD BY W. SMEDLEY ASTON

Comparing a good portrait of twenty years with one of to-day, can we see a satisfactory back bettering as expressive of such advance made in speed of plates, construction of lenses, and so on? I think not. On the face of it, and bearing in mind the number of workers in the field, one is tempted to believe that a certain point is not to be passed—one represented by the best style of work in a good photographer's window—were it not that we now and again come across a picture which immediately proves the contrary, by springing altogether ahead of the accepted high-water mark, and really coming pretty near perfection.

It is no haphazard chance that has produced the exceptionally good result, and if it can be done occasionally, it can as a matter of ordinary course, but not by holding to rules and methods in present high and exclusive vogue. Two such—and ones better altered as soon as possible—are, the subordination of too much to the lens, and the taking too long and deliberate a time over the operating.

The first consideration—it goes without saying—in portrait work is to catch a natural position or pose; but personality is expressed by far too fine shades to stand the handling of the ordinary photographer, mainly intent upon giving his lens the best chance. If the characteristic features be, say, a poise of the head, a thoughtful lowering of the brows, or the humorous mobility of a facial muscle, is it likely that it can survive the careful arranging of a head to gain a "Rembrandt lighting?" or a man accustomed to "spread himself" when at ease, is it possible for him to look natural, sitting closely and stiffly in his chair to suit photographic planes?

What are we to do? Must we develop into character readers, and artists, as well as photographers, to turn out "cabinets" at 17*s.* and 6*d.* a dozen? It would, of course, be well if we could add these qualifications, but it is certainly a bit too much to ask for the price, or for a higher one. But one thing we can very easily do. which would result in a marked gain, viz., leave the posing as far as possible to the poser. He, given the widest margin of freedom, is far more likely to assume a natural position than the one the operator places him in, and, in doing so, retain the individual peculiarities it should be such an essential first aim to catch and preserve. If in doing so he do not show a large proportion of face and front, why seek to alter it to suit any set canon hitherto worked up to? A particular amount of face is not a *sine qua non;* indeed, it is very conceivable that no amount at all need be; for it can safely be stated, that the reverse of many a medal is more interesting, and has more character about it than its face—and character is what we want, or should want, to portray. If the attitude be palpably an unphotographable one, a few short directions, with the reason for them, will, by an ordinarily intelligent man, be accepted at once with interest, and acted upon.

There should be a minimum of actual touching and arranging, even of dress folds.

Personally, from some cause or other beyond my control, I detest being lightly touched by anybody—it gives me "the creeps," and sours my otherwise generally acknowledged amiable temper. I believe that there are a great many people like myself in this respect; in any case, short of this violent dislike, no one, I imagine, can care to be fiddled with—have his head turned a little on one side, arm placed to lie in a particular position, foot shoved in a bit towards the body, and stand a final, deliberate, magpie judging of the result by the photographer from a distance. It makes one think too much of a draper's assistant arranging a dummy in the window, with oneself filling the part of the dummy.

Speedy working should be another feature, as closely aimed at as natural posing; for, granted an easy attitude and expression obtained, it is not likely to last through the ordinary, irritating shifting of the camera and its parts in focusing –very frequently the visit to the dark room to charge the slide, as well. There is no reason why the focusing should not be done beforehand, at least so approximately, as to mean nothing further at the critical moment than a correcting glance, and the turn of a screw; the shortest exposure possible, made as quickly and unobtrusively as practicable, and the work is done.

A good deal of what we hold as sacred in the existing photograph will have to be sacrificed, but it will be the sacrifice of the lesser for the gaining of the greater. The portrait lens that "speaks" may not be a practicable instrument under the suggested changed dispensation; but then if it "speaks" so unnecessarily as it generally does, I fail to see that its ousting from its present position need cause any great weeping and wailing. I cannot regard as of first importance such extreme definition, for instance, as we gain in our present use of it; flesh so faithfully rendered that we can make a fair guess as to what the sitter takes with dinner, or the texture of cloth so well brought out that a tailor could almost tell what a yard it cost. The impressions we carry of our friends are not such finely analysed-out ones as these; the eye does not go so minutely into things as the lens, but takes altogether a far broader impression, and a one we would come nearer to, and thereby reaching success, in getting rid of our close holding to this, and the few other studio rules at present in use, with their wooden, finnicking, meretriciously polished results, and going in instead for the breadth of a natural pose, freshly and quickly caught.—*British Journal of Photography.*

L'ALLEGRO BY DR. HALL EDWARDS

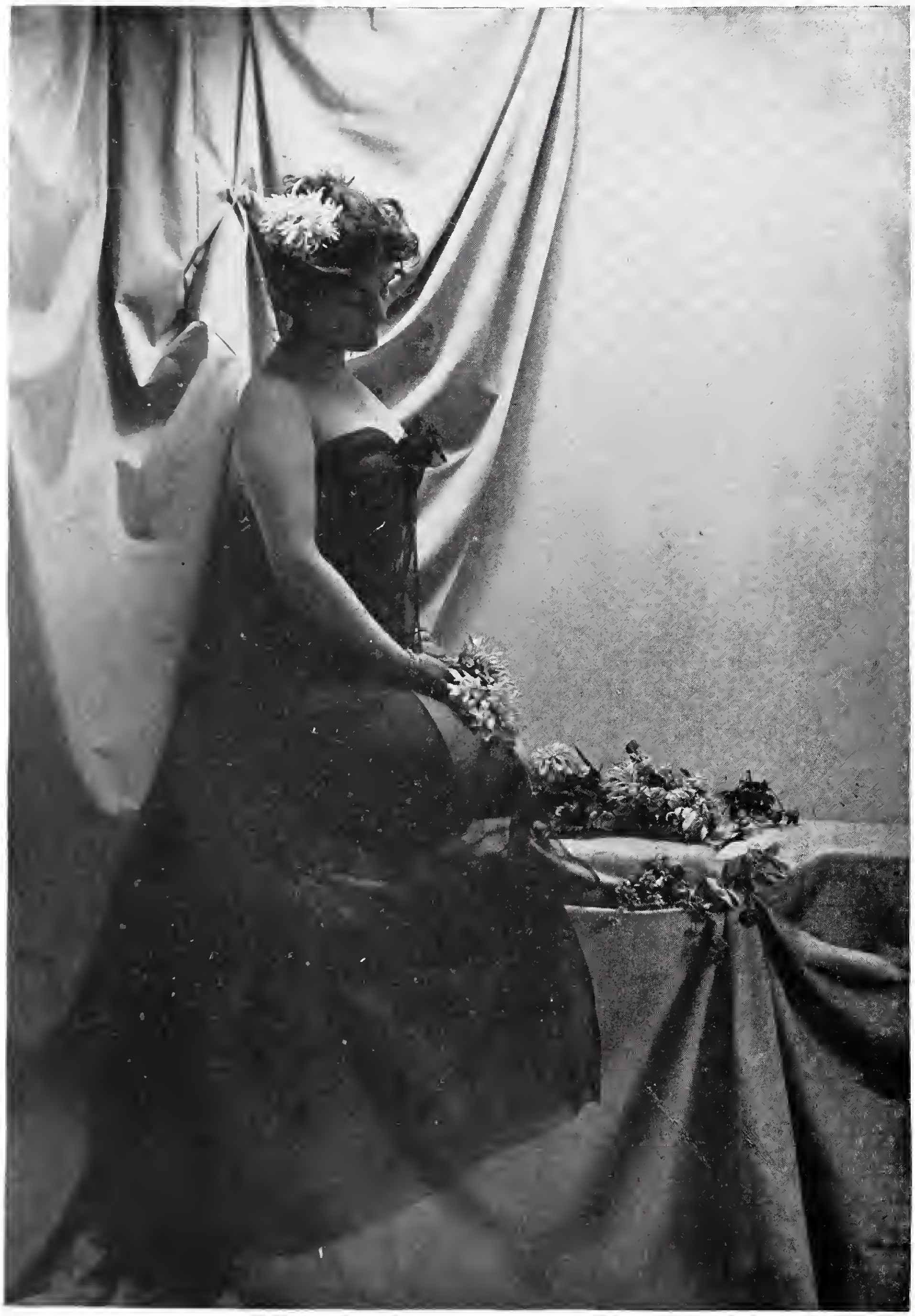


FIGURE TOMBALE

BY C. PUYO

EDITORIAL NOTES

LETTERS congratulating us on our 1898 "Annual" continue to pour in with every mail, but what is more satisfactory still is the fact that almost the entire edition has already been exhausted.

= = = = =

The little illustrations which accompany these notes are views of Rotterdam, taken by Mr. Maurice Bucquet, with a Carpentier Photo Jumelle, a French hand camera. Many of these quaint old Dutch cities are perfect Paradises for the hand camerist.

= = = = =

"Next Friday, December 10," writes Mr. E. Long, of Quincy, Ill., "is my 74th birthday, and it was fifty-five years ago last July that I commenced Daguerreotyping, and am still in the harness. I believe I am the oldest photographer in the United States still in the business." We shall be pleased to hear from any photographer who can beat this record.

= = = = =

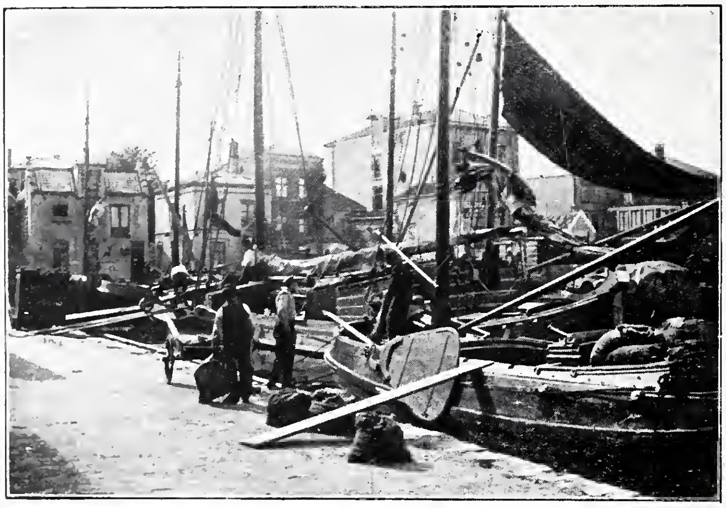
Mr. R. D. O. Smith, a well known contributor to this magazine, writes us as follows:

Among other Christmas joys came "The American Annual," and it claimed immediate attention. I read therein, not without surprise, a defense of short focus lenses by Mr. W. H. Sherman, and it seems to me his errors of statement require attention, because the sins of short focus lenses ought not to be condoned. Some three or four years ago I visited an exhibited collection of gigantic paintings, mostly war scenes, from the brush of a painter of world wide renown, and was astonished to see some three or four pictures of a different character, interior scenes in palaces in India, with all the wonderful distortion of perspective which the wide angle lens alone is originally capable of. I was astonished that such a painter should have copied a photograph, and more astonished that he should have done so without attempting to correct the perspective lines, which it would seem, *must* have been apparent to him as to anyone. Since that time I have observed several evidences that other painters occasionally employ similar materials with similar results.

The surprise expressed in Mr. Sherman's opening paragraph is in itself surprising, because in a somewhat extended experience with photography I have never before encountered a defender of the wide angle lens, though all photographers, like myself, find it useful in the sense that for many purposes it is far better than nothing. The quotation from the Times is true, and it seems impossible that any one can be unaware of its truth, though the statement might have been truthfully enlarged; *but many artists and many photographers are not sufficiently skilled in art to know or care anything about it.*

That Mr. Sherman is wrong is proved from his own article. On page 149 of "The Annual," his Fig. 3 is a picture of the old court house and square in Milwaukee, and he says "from the old fashioned gate in the foreground, to the extreme distance, the

foreshortening of the fence and sidewalk under the avenue of trees is perfect." Evidently he misunderstands what the quoted author meant by foreshortening. There will be no dispute that the wide angle lens will within limits project straight lines as straight lines, but foreshortening has to do with something else. It refers to correctly portraying distance, and that, Fig. 3 fails to do. To the eye the appearance of distance from the gate to the court house is at least double what it should be. It looks as though it were a quarter of a mile, whereas it *ought* to look less than half that distance. That is false foreshortening, and is the thing the quoted author was talking about. If the photograph had represented the scene so truthfully as to convey to the mind the impression of relative distances, as the eye would have done, either the building would have appeared much nearer and larger, or the gate would have appeared much more distant, and the line of the sidewalk would have inclined much further to the right.



Take such a picture as his Fig. 2, where there is nothing in the near foreground to attract comparison, the distortion may be passed over, but I will venture to say Mr. Sherman himself will admit that the street represented there is not in reality one-fourth so wide as it looks to be.

Mr. Sherman says "Fortunately what is true perspective * * is simply a question of geometrical construction," but in that statement he is entirely mistaken. Perspective has nothing to do with geometrical construction, and its only relation to geometry rests in an empirical use of geometrical methods to produce an approximation to the truth. "3. The art of representing solid objects on a flat surface so that when they are viewed the eye is affected in the same manner as it would be by viewing the objects themselves from a given point," *Century Dict.* Therefore a picture is true perspective when it looks to the eye as the object looks, and if it does not so look it is not in true perspective. Fortunately the great majority of human eyes are normal. The affected ones do not count.

Some mathematicians, without knowing much of art, have laid down geometrical elements for perspective. One of them demonstrated that in an oblique view of a colonnade, the most distant column would appear larger than the one nearest the eye. He admitted, however, that this strange result could only be attained by placing the eye at one certain (impossible) point. The drawing masters have quite generally supposed, because geometrical methods are handy the mathematicians were right, and in the schools the geometrical method has been usually taught, as it is at West Point to-day. But that does not make perspective a part of mathematical science. Why the short focus lens distorts distance is not difficult to show. From my own experiments, I am satisfied that a focal length of 18 inches is about right to produce normal perspective, and I am very sure the diagonal of the plate which a lens will cover has nothing whatever to do with it.

Supposing we set up a camera with a lens of 4 inches focus, and in front of it place two objects, one fifty feet away and another two hundred feet, and at the same point another camera with a lens of 18 inches focal length. Mr. Sherman says the pictures made by these

two cameras will be exactly alike, field by field, except that one will be smaller than the other; but he is mistaken. One will make a picture which to the eye will give a true idea of distance or foreshortening, and the other will make the distance at least twice as great as it ought to be, and to prove in advance that it must be so, calculation shows that the 4 inches focal length of the one lens is 0.66 per cent. and 0.16 per cent. respectively, of the distances of the two objects named, while the 18 inches focal length of the other lens is 3 per cent. and 7½ per cent. of those distances, a relative difference of 4 in the former and a little more than 2 in the latter. To the little lens the distance between the objects is almost twice as great as it appears to the larger lens, and it is apparent they *cannot* represent them alike.

When one looks at a photograph it is usually about ten inches from the eye. The objects in a scene photographed with a lens 18 inches focus, held about 10 inches from the eye will very closely subtend the same visual angles that the objects themselves will subtend when viewed from the location of the camera.

If this proves true, then the 18 inch lens portrays objects in true perspective, but it is certain the short focus lens cannot make a picture the same, whether it embraces the same angle as supposed in his Fig. 1 or not.

- - - - -

Miss Frances B. Johnston contributes to a recent issue of the *Ladies' Home Journal* a well written article on professional photography as a career for women. Unlike most writers on such subjects Miss Johnston speaks from actual experience, for few women have been so successful in this line of business.

"Photography as a profession," she says, "should appeal particularly to women, and in it there are great opportunities for a good paying business—but only under very well defined conditions. The prime requisites—as summed up in my mind after long experience and thought—are these: The woman who makes photography profitable must have, as to personal qualities, good common sense unlimited patience to carry her through endless failures, equally unlimited tact, good taste, a quick eye, a talent for detail, and a genius for hard work. In addition, she needs training, experience, some capital, and a field to exploit. This may seem, at first glance, an appalling list, but it is incomplete rather than exaggerated: although to an energetic, ambitious woman with even ordinary opportunities,

success is always possible, and hard, intelligent and conscientious work seldom fails to develop small beginnings not large results."

After some good practical advice on the arrangement and management of the studio she concludes by saying: "Good work should command good prices, and the wise woman will place a paying value upon her best efforts. It is a mistaken business policy to try and build up trade by doing something badly cheaper than somebody else. As to your personal attitude, be businesslike in all your methods; cultivate tact, an affable manner, and an unfailing courtesy. It costs nothing but a little self-control and determination to be patient and good-natured under most circumstances. A pleasant, obliging and businesslike bearing will often prove the most important part of a clever woman's capital.

"By the judicious and proper exercise of that quality known as tact, a woman can, without difficulty (in fact, she can readily), manage to please and conciliate the great majority of her customers—even the most exacting ones. She may do this, too, without being very greatly imposed upon—without being imposed upon at all. Tact, I would emphasize, is a great factor in successfully conducting a photographic studio; it is, I suppose, a virtue to be cultivated by every one who has dealings with the public, and who is brought into contact with people in whatever business or calling she may be engaged.

"Above everything else be resourceful, doing your best with what you have until you are able to obtain what you would like. Resource, good sense, a cultivated taste and hard work form a combination that seldom fails of success in a country like ours, where a woman needs only the courage to enter any profession suitable to her talents and within her powers of accomplishment."

= = = = =

The Polytechnic Institution of London has just issued an attractive programme for the ensuing season of its useful and entirely practical School of Photography. The fees for the course of six months range from five to fifteen shillings for each class, the instruction given being progressive and personal. Lectures will be given on the Art and Technique of Photography, by Mr. A. Horsley Hinton, Mr. Howard Farmer, and others, while the practical classes will be conducted as follows:—Photographic printing in silver, platinum, and carbon, by Mr. F. T. Beeson, F. R. P. S.; Bromide printing and enlarging, with enlarged negative making, by Mr. John H. Gear, F. R. P. S.; Finishing enlargements, by Mr. Ernest Wesson; Three-color and ordinary process photography, by Mr. Alex. A. K. Tallent; Photogravure, by Mr. Howard Farmer; Lithographic printing and photo-lithography, by Mr. J. F. Sleap; Wet collodion, by Mr. Thomas Stephenson; and Collotype, by Mr. George Holzhausen. All these gentlemen are well known practical experts. It is greatly to be regretted that we have no institution in this country taking so much interest in the science of photography.

= = = = =

We desire to call attention to the fact that our competitions will be closed on the 31st inst. We trust to receive a large number of entries. If we find that our readers take but little interest in them, we shall certainly discontinue them, as it will not be worth the trouble and expense.

= = = = =

The exhibition of Kodak pictures recently held at the Academy of Design by the Eastman Kodak Co. was certainly a remarkable one in many ways, and should do much to popularize photography. The rooms were most tastefully decorated, and it was difficult to recognize this miserably fitted up building. The method adopted of hanging the pictures with taste and judgment should give a lesson to the artists who hold exhibitions of paintings there.

= = = = =

Many of the pictures were enlargements from small snap-shots, and remarkably fine enlargements, too. Among the exhibitors are many well-known American photographers, including Stieglitz, Berg, Post, Breese, Eickemeyer, Johnston, Ben Yussuf, etc. The Eastman Co. have reason to congratulate themselves on the success of their efforts, and the American public should congratulate itself on having been able to view the finest collection of pictures ever shown in this country. Not the least interesting was the photographs of the Royal Family made by members themselves.

= = = = =

The editor of this magazine will be glad to receive examples of photographic curiosities, such as double exposures, wide-angle freaks, combination pictures, etc., etc. Full credit will be given and remuneration made.

EVERYDAY HINTS IN DEVELOPMENT.

By W. Ethelbert Henry, C. E.

Bromide of Potassium, as a restrainer, may be used with any developer regardless of the alkali used. It is not advisable to use ammonium bromide with pyro-soda, owing to the possibility of ammonia being set free and so upsetting the balance of the developer. It may be used with pyro-ammonia.

Citrate of Soda is a far more powerful restrainer than potassium bromide, and does not tend to fog the shadows. A few drops of a ten per cent. solution added to the developer will entirely check development of the shadows, keeping them clear, while permitting the accumulation of density in the high lights.

Temperature has a great effect on development. Cold solutions act as retarders and give poor thin negatives that appear to be much under-exposed ; this accounts for many failures during the winter months. On the other hand, warm solutions act as accelerators, causing development to proceed with great rapidity with every appearance of over-exposure ; herein we may account for many summer failures.

By modifying the Temperature to suit the exposure, we have an additional command over development. For instance, a plate that is well known to be under-exposed, should not only have the constituents of the developer so adjusted as to include a maximum of alkali and a minimum of bromide, but the normal temperature of the solutions (say 60 deg.) should be raised to 70 deg. or 75 deg. F. This will be a great assistance in bringing out detail and effecting rapid development. Of course, the temperature must not be raised too high, or frilling of the gelatine will result ; and in any case, the plates in warm developer must be handled more carefully than those in developer of the normal temperature.

Cases of Over-Exposure require a diametrically opposite treatment. We must reduce the accelerator (alkali), increase the bromide, and use a large proportion of pyro or hydroquinone as the case may be. If we at the same time lower the temperature of the bath (by means of an outer tray containing ice or a freezing mixture) to about 50 deg. F., we exert an additional retarding action without fear of chemical fog.

Transparent Spots, pin-holes and similar markings, are due to careless development and may easily be avoided. They are never seen upon negatives made by a cleanly and careful worker. If the specks are of irregular form, they are the result of using a dusty plate, and may be avoided by gently dusting the film before exposure and before development with a wide camel-hair brush If the brush is applied too vigorously, the plate will show straight transparent lines after development. Regularly marked circular spots of varying sizes are caused by air bells settling on the surface of the plate in the developer. Wipe the face of the plate (while in the developer) with a large wad of wet cotton wool and they will not appear.

Dark Spots are also due to imprisoned air, but in this case the air bells are formed in the fixing bath, and so protect the film beneath from the action of the hypo. The result is, of course, a further reduction of the sensitive bromide emulsion upon exposure to light, and after the light has once done its work it is impossible to remove the spots by subsequent additional fixation. The plate should be examined while fixing and air bells gently removed with cotton wool.

A mottled appearance over the entire film, may be due to various causes. If pyro be the developer employed, the markings are easily caused by leaving the plate at rest instead of rocking it. With the newer developers it is not so important to keep the solution in constant motion over the plate, so long as its surface is well covered. Another fruitful cause of mottling lies in the careless use of an alum bath, either before or after fixing. In either case the appearance is similar ; a series of mottles of irregular density showing, when dry, a whitish deposit insoluble in water. These are due to deposition of sulphur compounds in the film, and may be prevented by a thorough washing between the hypo and alum baths ; but a far better plan is to dispense altogether with an alum bath, which is rarely, if ever, of any service in the making of a negative.

Plates liable to frill are a nuisance and should be discarded at the earliest opportunity, but at the same time, it is well to know a safe way to prevent frilling without the use of alum. A few drops of formalin added to the developer, or added to a preliminary bath of water, will cause the most refractory film to hold to its original support. Even the use of formalin, however, is not desirable. Films treated with formalin or alum become unmanageably hard and, in the course of time, contract unduly. This contractile action frequently goes so far as to cause the film to leave the glass in the course of time, dragging with it fragments of glass from the surface of the plate. Therefore it is well to find a good plate free from all evil tendency to frilling (and there are many such), then stick to it through thick and thin and give up the use of alum.—*The Photogram.*

THE PYRO-SODA DEVELOPER.

By C. G. and J. C.

In experimenting with the pyro-soda developer, we have been met with this difficulty: there is no standard formula, the excellence of which is beyond controversy, and we have been in doubt to know which to choose for our tests When we decided upon the formula with which the above given tests were made, we were led to do so by this consideration—pyro-soda is in the main a studio developer, largely used by professional photographers; and the formula we chose was one kindly given us by one of the most distinguished of these, in whose hands we know it is capable of producing most perfect portrait negatives.

The results of our tests are disappointing to the admirer of the pyro-soda developer. It has its good qualities without doubt; plates developed in it do not show green fog; the substitution of a stable soda solution for volatile ammonia is a distinct gain, and considerable variations in temperature and in the relative quantities of solutions A and B make but little difference in the speed of the plate or the quality of the negative. These, as we have before hinted, are important considerations in studio work; but in adaptability pyro-soda is far below pyro-ammonia. Given the knowledge that plate No. 1 is under-exposed and plate No. 2 over-exposed, pyro-soda will allow you little power in remedying these defects. The extreme limits of speed modification must be represented by 2 to 1 only. It will be seen on reference to the experiments that too much soda is used in the formula; the reason for the excess is probably in the difficulty in obtaining a sufficient density for printing purposes in a short time. Pyro-soda is essentially a slow-acting developer, possibly this explains also the omission of bromide from most soda formulæ. Variations of temperature up to 65 deg. cause little difference in speed, but above that point they act very prejudicially, causing a reduction in speed and increase of fog. It is noticeable also that in every case addition of alkali after development has commenced causes diminution of speed.—*Dry Plates.*

AN OFFENDING NOVELIST.*

BY C. S. M.

"That ubiquitous nuisance, the 'Amateur Photographer,' can there [the Mena House Hotel, near the Great Pyramid] have his 'dark room' for the development of his more or less imperfect 'plates' * * *"—*Ziska*, by Marie Corelli.

I sob upon the sandy sea
Of Egypt's shingly deserts free,
For M. Corelli girds at me—
I am an amateur.

With *Ziska* open in my hand,
And chapter thirteen roughly scanned,
Behold, I'm branded with the brand
"Ubiquitous" indeed!

Still more the agony is piled
For I am chidden like a child,
And most unwarrantably styled
That "nuisance" too, forsooth!

I ask why authoress so bold
Should such opinions of us hold,
And why on earth she wants to scold
The harmless amateur.

A fine contempt she has I know
For all who humbly come and go—
Like tourists—on this earth below,
E.g., the amateur.

She deals with types of kingly mould,
With mouldy kings, or mummies cold,
Princesses,—anything that's old
Or somewhat mystical.

Godhead or ghost, or sprightly spook,
E'en Satan she will "bring to book"—
At Visibles she will not look
Like a photographer.

But still I ponder mid the sand
And try again to understand
Why she has raised a hostile hand
'Gainst us photographers.

When one of her "electric thrills"
(Or psychic) me with visions fills
Harken the truth that now distils
Like inspiration wrapt!

Perchance, when in the sunlight glare.
As she of Egypt took her share,
Some ribald Kodaker was there,
Some nincompoop—some Man.

Perchance he caught her ill at-ease
When fiery blew the desert breeze,
Or fiercely bit the Cairene *****—
Impertinently bold;

Or, spite of recent statements met
Within the press, did he then get
Corelli and a mild cigarette
On his "imperfect" plate?

Or in some company absurd
(Such things will hap, as I have heard)
Corelli with some tourist herd
Upon a donkey perched?

Or as she strode (as sure she did)
Up Gizeh's awful pyramid
(A biped plain to all)—that id-
Iotic amateur!

Perchance she tried—ah! breathe it not—
With poor success t'accomplish what
She now reviles in language hot—
To take a photograph.

* * * *

I rise from out the desert dust
That powders from its rocky crust
Where pyramid and temple rust
In slow but sure decay,

And cry "O genius of this land,
Time-riddled sphinx, so calm and bland,
This riddle now I understand"—
The sphinx does not say "Nay."

BLUFFS AND FARM LANDS ON BIG RIVER, MO.
"IRON MOUNTAIN ROUTE"

---

* Journal of the Amateur Photographic Society of Madras.

NOTES AND NEWS

To Stop the Toning Action place the prints in a bath of salt and water. Wash before fixing.

Thin Negatives should be printed in a weak light or behind a sheet of green glass. Greater contrast is thus obtained.

The Photo Review is the name of a new photographic magazine published in Deerfield, Wis.

The paper covered edition of the American Annual of Photography for 1898 is entirely exhausted. Only the cloth bound copies remain, and they are few in number, at that.

The telling role played by photography in the advance of Astronomy and the exposition of the elementary principles of that science is well exemplified in Prof. Todd's *New Astronomy for Beginners*, just published by the American Book Company of New York.

Dark Room Was Unnecessary.—Kodak—I succeeded in developing a splendid negative in a strong light yesterday.

Lens—How did you manage it?

Kodak—Asked Miss Richleigh to marry me.—*Chicago News.*

A Record in Cinematography.—A Bradford photographer was present in London at the time of the Queen's Jubilee for the purpose of making cinematograph pictures of the scene. After making his exposures he took the 5.40 P.M. train to Bradford, 190 miles away, developing the film *en route*, in a carriage specially reserved for the purpose, and then close on midnight, the train not arriving till after eleven, he exhibited the pictures to a large crowd assembled outside the office of a Bradford evening paper. The achievement is certainly a remarkable one.

Blue Toning Bath for Transparencies.—

1.

10 per cent. solution uranium nitrate	$2\frac{5}{8}$ drams
Distilled water	25 ounces

2

10 per cent. potassium ferricyanide	$2\frac{5}{8}$ drams
Distilled water	$3\frac{1}{2}$ ounces
Glacial acetic acid	10 drops

At the time of using mix equal quantities of 1 and 2. The positives will become in turn brown, sepia, red. Wash the plate for two or three minutes, and immerse in a 25 per cent. solution of sulphate of iron. The redder the image in the first bath, the bluer it will become in the second.

Exposed Dry Plates, says Count Vittorio Turati, can be used as positives. Bathe the plate in a 2 per cent. solution of ammonia bichromate at a temperature of 15 deg. C for about five minutes, and let it dry in a concentrated sodium fixing solution, then a beautiful vigorous silver bromide positive full of detail develops. As soon as all the details have appeared, and the lights are perfectly transparent, rinse well. The resultant silver bromide picture is extremely clear and brilliant. To blacken it, it is only necessary to treat it with an ordinary photographic developer. As no silver precipitation can take place, no more silver bromide being present, no fog can arise, and even with long development clear diapositives are obtained.—*Phot. Zeitung.*

Backing Mixtures for Halation.—(1) Of common gum-arabic make a strong solution and filter through fine canvas. Buy some dry ground burnt umber or burnt sienna at the "oil shop." With a palette knife and the back of a dinner plate mix sufficient of the ground powder color and gum solution to form a smooth thick paste. With methylated spirit thin this mixture down to the consistency of cream and apply to the glass side of the plate a thin coat by means of a varnishing brush.

(2) Sometimes it is required to back a plate in a hurry, and as gum-arabic takes some little time to dissolve this is not available. A thick paste, either of starch, flour, or gelatine in water may be used in place of the gum solution as given above.

(3) If the ground dry powder colors are not available perhaps it may be possible to precure some burnt sienna, umber, or vandyke-brown in collapsible tubes as used by painters. Some of this is squeezed out on the back of the plate and spread by dabbing with a bit of rag or the finger end.—*The Amateur Photographer* (England).

A Face in a Photograph.—There is quite a touch of sentiment allied with common-sense reasoning in a little true story with this title that recently appeared in *Cassell's Saturday Journal* During a dark period of his life, the author one day found himself alone and penniless in London. While wandering about he stood gazing at some views of the City exhibited in a photographer's window. Suddenly his attention was riveted on the figure of a man in a picture of Cheapside. He felt sure it was an old friend of his of whom nothing had been heard for years. The writer noticed that the hands of a clock in the picture pointed to 5.15, and he shrewdly conjectured that the photograph had been taken in the afternoon, and that his friend was returning from business at the time. So he commenced a systematic watch in the neighborhood, and in a few days he was rewarded by meeting his friend. If the latter had been a young lady with whom the writer was in love, and from whom he had been parted years before, etc., etc., the incident would quite be parallel to one that has often been used by writers of fiction.—*The Photographic News.*

The Size of Stop.—Very many workers, says *The English Amateur Photographer*, get into the way of using the same sized stop for every subject as long as it is sufficiently still to make it possible. This seems to be a distinct neglect to profit by the powers of the lens, for there is no doubt great variation in the result may be obtained by alteration of the aperture. Small stops give hard, bright, fine definition, with a loss of roundness of modelling and atmospheric effect. Large stops, on the contrary, have the latter virtues—most important ones in the making of a picture—and besides this they enable more detail to be obtained in the shadows.

It would therefore seem that the best plan, in other than exceptional cases, is to use the largest stop possible, so long as the degree of focal sharpness is obtained on the focusing screen. In the cases, where there are not many planes, or where there are no near objects, a comparatively open aperture may be used and the benefit will be obvious.

Trimming Prints.—There is often a tendency to allow the plate and paper maker to decide the size and shape our photograph must ultimately be, and probably this is increased by a disinclination to try experiments in cutting at the risk of spoiling a print. But if two **L** shaped pieces of white card are cut, each side of which is about 3 inches broad and, say, 10 inches long, and if these are placed on the print so that the card overlaps and forms a border, they may be easily arranged so as to judge any one part independently of the others, and to try various shapes and sizes When the exact measurement is decided, it a good plan to paste border lines of lantern binding strip on the glass slide of the negative, for by this means we get a permanent record, and may use smaller sizes of printing paper perhaps, and furthermore, if the paper is allowed to slightly overlap the masking, we obtain a pleasing white margin which is especially suited to some subjects. Of course, the strip may easily be washed off at any time if it is necestary to print from the whole of the negative.—*Amateur Photographer* (English).

A New Use for Photography.—The Deputy-Master of the Mint, Professor Roberts-Austen, in a memorandum to his recently issued report, refers to a new mode of utilizing micro-photographs. An engraver who may have devoted months of work to the preparation of a die is always more or less uncertain whether the subsequent and inevitable operation of hardening will be successful or not. It is satisfactory, therefore, to find that more information as to the suitability of steel for the manufacture of dies can be obtained by a micro-photograph of a prepared section of the metal than by subjecting it to the laborious process of chemical analysis. What is wanted is some assurance that a piece of metal will harden safely when the engraver has done his work, and this is supplied by photography.—*The British Journal of Photograph.*

A Developer in the Form of Powder.—G. Bani, of Pisa, recommends the following developer, which, kept in the form of powder, is very simple to use, very economical, and gives excellent results :—

POWDER A.

Metol	4 drachms
Hydroquinone	10½ drachms
Eikonogen in Powder	6¼ drachms
Boracic Acid, pulverized	2½ drachms

These chemicals are well mixed and kept in a yellow bottle hermetically corked.

POWDER B.

Sulphite of soda	25¾ drachms
Borax	6½ drachms
Sugar of milk	6¼ drachms

This powder is kept in a white bottle well corked. For use take :

Water	100 parts
Powder A	2 parts
Powder B	4 parts

For gelatino-bromide paper, this developer should be diluted with an equal quantity of water.—*Il Dilettante di Fotografia.*

The Preparation of Celloidine Paper.—In the *Deutsche Photographen Zeitung*, Belitzski gives the following method of preparing celloidine paper:

Strontium chloride (crystal)	30 parts
Lithium chloride (anhydrous)	10 parts
Distilled water	62 parts

When dissolved, add—

Glycerine	160 parts
Absolute alcohol (by weight)	218 parts

To make the collodion—

Raw celloidine collodion (three per cent.)	400 parts
The above solution	30 parts
Silver nitrate	12 parts

The silver should be dissolved in sixteen parts of water by the aid of heat, and mixed with thirty parts of absolute alcohol, before adding to the salted collodion. Finally, to the collodio-chloride emulsion should be added—

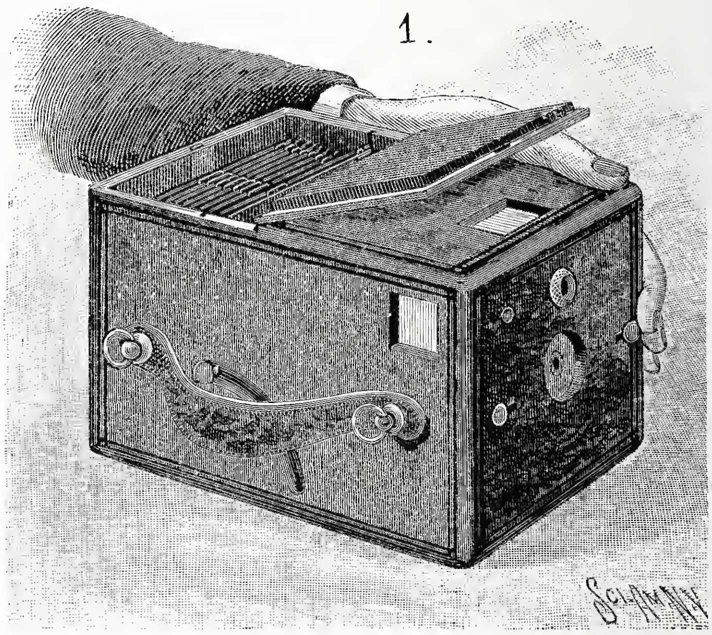
Saturated alcoholic solution of citric acid	12 parts
Ether	50 parts

All these should be weighed and not measured out. If the paper is to be kept, it should be brushed over on the back with a two per cent. alcoholic solution of citric acid. The paper is ready for use in half an hour.

Sunlight and Shadow.—We are often asked if there is any good book, or what is the best book, to tell a beginner all about photography. One is always tempted to answer, " there is none," but that the sincere seeker after information ought not to be thus discouraged at the outset of his inquiries. But photography has been, from its very birth, such a changeling that any work designed to instruct us completely in its theory and practice, has become antiquated, in part at least, in a decade after its publication. So that he who would know photography in all its moods and tenses can never be satisfied with any one book, however extensive in its scope, but must supplement his studies with the later records of the experience of the master minds who have devoted themselves to the investigation and practice of this fascinating art science. The Scovill & Adams Company, recognizing this need, has from time to time published, in its "Photographic Series," various small volumes designed to smooth the path of the beginner and likewise to initiate the advanced student into the mysteries of the higher walks of the art. This series now numbers nearly sixty books, and the latest number, written by W. I. Lincoln Adams, and picturesquely entitled "Sunlight and Shadow," is a very welcome edition to the list. It is not likely that this little work will become old before its time, more especially as it does not treat of the mere technical processes of photography, a fair knowledge of which, by the way, is presumed on the part of the student. It is intended to help the alumnus to make pictures out of his photographs, rather than to teach him optics, or chemistry, or photographic manipulation. Much of its material has appeared in other publications of the Scovill & Adams Co., notably the PHOTOGRAPHIC TIMES and the AMERICAN ANNUAL, but not in such compact form nor in such sumptuous dress. Mr. Adams, in his preface, modestly disclaims having acted as more than editor, or compiler, of the notes of a number of men who have become world famous for their achievements in pictorial photography. But we think he has done much more than this. Not only has he written on several of the special branches in a masterly manner himself, but the whole book of 14 chapters, although embodying the ideas of many men of strong individuality, on subjects concerning which there is necessarily a vast difference of opinion, is so harmoniously blended by our author, that it reads like the production of a single mind, but a mind, however, extraordinarily gifted. It is as if we had joined a photographic club, in which Mr Adams had introduced us to many of his most distinguished and talented friends. We are thus made acquainted with H. P. Robinson, who talks to us on Foregrounds, and Skies, and Marines; with Alfred Stieglitz, who tells us about the Hand Camera and how to use it; with W. E. Woodbury, an authority on Instaneous Photography and the Portraiture of Children; with W. A. Fraser, the author of Photography at Night; with J. Wells Champney, who gives us some novel schemes of Lighting in Portraiture, and with Xanthus Smith, whose hints on Choice of Subject form the introductory chapter of the book Nor do these newfound friends confine themselves to a mere discourse. They give us example, as well as precept. The book is filled with beautiful illustrations, some made by the authors expressly for the exposition of their talks, but many selected by Mr. Adams himself, with admirable judgment, from the works of those who are noted more for deeds than words. All of the pictures are from halftone blocks, even the full-page examples, and so perfect in their execution that we prefer them to any but the very finest photogravures. The full-page subject "Mending the Nets," by A. Stieglitz, is the finest halftone print we have ever seen. It is hard to conceive how any copper-plate impression could equal this in richness of tone and transparency of shadows. Concerning the typography, binding, and general arrangement of this little book, we cannot speak too highly. Considered apart from its photographic purpose, its wealth and quality of illustration make it an addition to any drawing-room table, where it may take its place with volumes specially prepared for the midwinter holidays.—W. M. M. in *Camera Notes*.

A Novel Hand Camera.—The remarkable progress that has been made within the past few years in the construction of hand cameras, whereby their cheapness, lightness, compactness, simplicity and accuracy are some of the predominant points, it is well exemplified in the camera called the Adlake, which is the subject of our illustrations.

The well-known box form of camera is adopted, and comprises at the front all of the important essentials for good work; as, for example, a lens easily removable for cleaning, a set of diaphragms quickly adjusted, a very simple yet rapid shutter, easily released, positive in its movement and quickly adjustable for time or instantaneous exposures. There are also the usual two finders for taking the picture in a vertical or horizontal position. On the rear is a space for holding twelve remarkably compact and simply constructed metal plate holders, plainly observable in Fig. 1 and in detail in Fig. 2. Each plate is exposed separately, withdrawn from the box and transferred to the rear of the series until all, or as many as desired, are exposed, each holder having stamped on it a separate number.



1.

The construction of the plate-holder and mode of operation will be observed in Fig. 2. Two vertical grooves in the box on each side hold a metal plate holder frame having a small recess cut out in each side, as will be noticed by a blank space in the upper part of Fig. 2. The thin metal plate holder, just thick enough to hold one glass plate, provided with a hinge side, the latter having on its upper edge and outer corners light wire clamping or locking springs, is pushed down in the metal plate holder frame just described. Just in front of the frame are two skeleton fingers, having at their upper ends curved portions which fit into the black recess shown in the plate holder frame, and are attached to the axis of a revolving shaft at the bottom, at the end of which is also a push crank projecting through the box, the knob being seen in Fig. 1, on the side. To make an exposure the finger frame is turned into a vertical position until it fits snugly into the plate-holder frame. The plate holder is then inserted, which brings the corner projecting clamping wires into the curved ends of the finger frame. The cover of the box is shut, then the knob on the outside is pushed down. This carries forward the finger frame downward in the arc of a circle, which takes with it the door of the plate holder, leaving the latter in a horizontal position on the bottom of the camera. After the exposure is made the knob is pushed up tightly, which closes the door of the holder, it being secured by the three wire clamping springs. The cover of the camera is opened, the plate holder removed and another plate inserted. The plate holder is made with a thin rabbet edge, in which the edge of the plate holder door or side fits and excludes all light.

Referring to the mechanism of the shutter, Fig. 3, it will be noticed that the shutter is of the ordinary oscillating fan-shaped type, having an elongated aperture, working on a pivot from one side to the other in opposite directions, and that a very small movement just below its axis produces rapid movement above. To this portion is attached a link secured to the lower end of a long swinging vertical arm, or lever, pivoted at the top, seen on the left. A rapid movement of this lever near its fulcrum will give an extremely rapid motion to the shutter. Behind this lever will be seen the pivoted black operating swinging lever, on the end of which is secured the operating oscillating spring, having one end attached to the long vertical lever not far from the fulcrum.

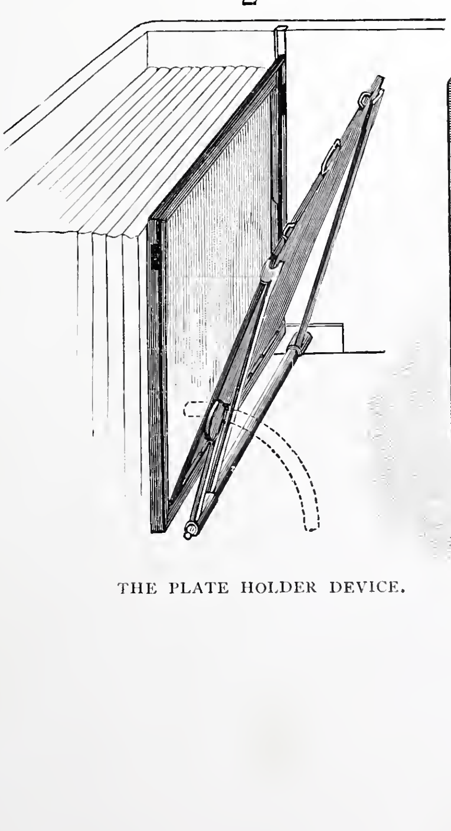
When the operating lever is pushed in one direction by the knob on the outside the spring is partly rotated until its center is above the attached end, causing the shutter lever to be suddenly pushed in the opposite direction, giving a corresponding rapid movement to the shutter. Pushing the operating lever in the opposite direction makes the spring carry the long lever to the other side. In this way a slight side pressure on the push button quickly operates the shutter without a jar or difficulty. A second pivoted lever (shown at the right, Fig. 3) pivoted at the bottom, to the axis of which is a flat spring, has a horizontal arm projecting from its center which engages with a like short arm projecting from the shutter proper. It may be called a time lever. When the button on the outside is pushed toward the lens, the arm on the lever engages the arm on the shutter and stops its movement, leaving the aperture open for time exposures When pushed away from the lens, the lever releases the shutter and allows the latter to close.

Above the shutter, and working just behind the lens, will be observed a star-shaped diaphragm plate turning around its center and having three different apertures. On the surface of the plate are slight indents, which engage in the end of the horizontal flat locking springs. The diaphragm plate is attached on the front to a rotating ring surrounding the finder lens and is thus rotated from the outside to whatever working aperture is desired.

Convenient strap rings are attached to the handle of the camera for carrying it over the shoulder or on a bicycle. Pictures we have seen made with it are clear cut and distinct, showing that its cheapness is no bar to the production of good work.

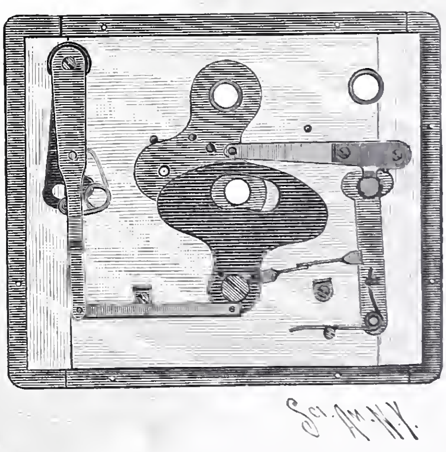
Its simplicity and certainty of working are its salient features, while at the same time its strength of structure is such as to permit of rough handling without detriment. The camera is manufactured by the Adams & Westlake Co., 103 Ontario street, Chicago, Ill , from whom further particulars may be had.—*Scientific American.*

2



THE PLATE HOLDER DEVICE.

3



THE SHUTTER.

TRADE NOTES

The well-known firm of Ross & Co. has been converted into a limited company, and will in future be known as Ross Limited. The issue of $200,000 preference shares was over-applied for.

The Gundlach Optical Co. have added a complete camera plant to their business, and intend turning out high-grade cameras. They are at present putting up a new building of four floors to be occupied principally for the manufacture of cameras.

Messrs. Lumière Bros., the well-known French manufacturers of plates and films and the inventors of the cinematograph, have just had conferred upon them by the Czar the order of St. Anne of Russia.

The Arrowroot Paper manufactured by Mr. John R. Clemons appears to be finding great favor. Here are a few of letters recently received by the manufacturer:

MR. JOHN R. CLEMONS:

Dear Sir:—Your Arrowroot Salted Paper is even superior to your Matt Salted, which I have been using for many years. I cheerfully wish you the best success with this new departure. Yours respectfully,

A. W. ROTHENGATTER.

PHILADELPHIA, Dec. 15, 1897.

MR. JOHN R. CLEMONS;

Dear Sir:—We find that your "Arrowroot Salted Paper," worked under the formula of James Kerns, proves very satisfactory: the results are beautiful in every respect. C. M. GILBERT.

PHILADELPHIA, Dec. 3d, 1897.

JOHN R. CLEMENS,

Dear Sir:—I have never had occasion to use your paper, but from the prints I have seen, can recommend it to anyone who has use for plain salted paper.

Respectfully,

SAML. W. BROWN.

PHILADELPHIA, Dec. 1st, 1897.

MR. JOHN CLEMONS,

Dear Sir:—Referring to your salted plain paper, will say that it gives me pleasure to recommend it where good quality and uniformity are required.

Truly Yours,

WILLIAM H. RAU.

PHILADELPHIA, Dec. 1st, 1897.

MR. JOHN CLEMONS,

Dear Sir:—Your salted plain paper has been used in this establishment for over twelve (12) years, and given entire satisfaction. Yours Truly,

GEO. W. ENNIS,
Foreman to WILLIAM H. RAU.

Mr. Carbutt, the well known dry plate and film manufacturer, recently undertook the manufacture of films for making and projecting animated photographs. In a recent letter received from the International Film Co. they say: "We have given your film a two days' test of constant projection, and so far we can say it has proven as you represented. We will, therefore, place an order for 1000 feet of positive film unperforated at 5 cents per foot."

Mr. Carbutt also sends us an interesting letter in which a customer shows how, by accident, he discovered the remarkable proof against heat exhibited by the Carbutt plate:

KEENE, N. H., Jan. 12, 1898.

MR. JOHN CARBUTT, Wayne Junction, Philadelphia, Pa.:

Dear Sir:—I met with a rather unusual experience the other day, and as it strikes me as being somewhat remarkable, I wish to give you the facts, since the matter concerns the plates which you manufacture.

I have been making lantern slides of your plates, and, although it is new business, I have been fairly successful.

The other night I had some of the boys come in for a little exhibition, and as a surprise I had made some lantern slides from negatives of the men themselves while they were in camp, etc. I had made eight slides, and as I have to do my work in the house, I put the washing box right into the bath tub and attached the hose onto the combination faucet. I developed the slides and got some very good ones, and some that were not, but I had to go down street as soon as they were done, and I left them washing, instructing my wife to be sure and see that a steady stream of water was kept running through the washing box. I had been down street only a few moments when my wife telephoned me, asking if I intended to leave the hot water running. I told her to shut off the water immediately and run cold through the box, and I rushed home. I found that I had turned the wrong faucet on the combination cock, and the whole 30 gallons of boiling hot water had gone through the washing box. We run a hot coal fire, and the water was just as hot as it is possible to get it in that way. I felt sad, because I had not time to make new slides, but I took up the box and found that the slides were all right. I think that the hot water affected them to a slight degree, but they showed up all right, and I confess that I was surprised. The water was so hot that, although the temperature of the bath room is kept at about 75, the room was full of steam, and when my wife went up stairs she could not even touch the washing box that the plates were in.

It may be that your plates will stand this treatment, but I shall not try it again I can assure you.

Very truly yours, F. E. KINGSBURY.

The Editor's Table.

Sunlight and Shadow.—"Including as it does, a quantity of valuable practical information, the book fulfils most comprehensively the intention set forth in the sub-title, but it is more than this. It is a beautiful book artistically, and is most tastefully bound and excellently printed. It has over a hundred exceptionally beautiful illustrations, which are notably even in quality."—*Brooklyn Times.*

La Chronophotographie, by L. Gastine. Published by Gauthier, Villars et Fils., Paris.

The present popularity of moving pictures will no doubt cause quite a demand for the little book by those anxious to know how they are made. The author deals with the history, detailing the work of Muybridge and others, bringing the book up to date with descriptions of the modern apparatus of Lumière, Demery, Edison, and others.

Die Entwicklung der Auscopier=Papiere by R Ed Liesegang, published by Ed Liesegang's Verlag, Dusseldorf,Germany.

A good deal has been written upon the subject of developing printing-out papers, but in this little booklet we find the fullest particulars of the process. It details the various methods and the different effects obtained with the various known developers. The process has, we fear, made little headway in this country, as the American photographer prefers to print his paper out in the ordinary way. Fortunately in this country, even in the shorter winter days, we are generally favored with enough light to make a few satisfactory prints by. In London, where weeks and weeks go by without a solitary glimpse of sunlight, we have little doubt that this method of shortening the time of exposure may find more favor.

Photographic Mosaics for 1898.—Edited and published by E. L. Wilson. New York : Price 50 cents.

This ever welcome little annual will be read with interest by all professional photographers for whom it is chiefly intended. In addition to a review of recent progress in photography there are many useful and practical articles by well-known writers, and even the most experienced photographers must learn a great deal from a careful perusal of them. The book contains quite a number of illustrations, chiefly the work of professional photographers ; with regard to these perhaps the least said the better. The selection is poor and the printing wretched.

The Illustrated Edition of "In Memoriam."—"Mr. Harry Fenn . . . has embroidered upon its margins, so to speak, the fine and graceful threads of his fancy in landscapes scenes and floral initials, portrait vignettes and leafy borders, glimpses of woodland solitudes and bits of mediæval architecture, all in a way not simply to decorate, but substantially to enrich and deepen the associations of the poet's lines. . . . . The short preface, which Dr. Van Dyke supplies as a portal to the stately edifice, is briefly historical and sympathetically critical . . . The publishers have been generous in carrying out the artist's designs."—*The Literary World*, Boston.

"Will give deep pleasure to a very wide public."—*New York Tribune.*

"Pictorial Effect In Photography," by H. P. Robinson. Fourth edition. New York. The Scovill & Adams Co. of New York.

Still another edition is required of Mr. Robinson's (it may also be called) classic work, entitled "Pictorial Effect in Photography."

The present is the fourth edition, which announcement in itself, speaks well for the value of the book. We can heartily recommend it to all studious photographers who are desirous of improving themselves in pictorial photography.

"Lantern Slides by Photographic Methods," by Andrew Pringle. New York. The Scovill & Adams Co of New York.

A new edition of this practical handbook on lantern slide making, has been called for and is now issued by the Scovill & Adams Co. of New York.

It has once before been reviewed at length in these columns, so we will merely announce the new edition at this time, recommending it to that rapidly increasing army of workers, who are most interested in this fascinating branch of photography.

The book may be obtained of any photographic dealer, or will be sent postpaid on receipt of the price, by the publishers.

The British Journal Almanac for 1898. Edited by Thos. Bedding. Published by Messrs. Henry Greenwood & Co., London, Price, 1 shilling.

Fatter and fatter grows this welcome annual until we are beginning to think of enlarging the editorial offices to accommodate future issues. All the old features are retained, and much new matter is added. A summary of the year is given by the talented editor, together with a very complete article on animated photography. There are also many useful and practical articles by various well-known contributors, and some excellent illustrations. The whole forms a work worth many times the price charged, and it should be in the library of every photographer.

ANSWERS TO CORRESPONDENTS

C. C. S., Scranton, Pa.—You will find two excellent articles on night photography in the 1898 "Annual,' and a number of pictures made at nighttime by Alfred Stieglitz and Paul Martin.

R. F. S., Newport, R. I.—You can prepare bromide prints for pastel work by applying finely powdered pumice stone to the print. Use the palm of the hand. This gives the required surface to the print and causes it to "bite."

M. A., Boston, Mass.—Carbon paper will keep indefinitely if stored in a dry place or hermetically sealed in a tin case. We know of no good paper made in this country. It is all imported. The best workers obtain it from different sources, according to the color required. The Autotype Co. of Oxford street, England, export large quantities to this country.

R. C. D., Buffalo, N. Y.—The deterioration of your negatives is due to the mercurial intensification to which they were treated. Negatives thus intensified are rarely permanent, more especially if they have not been properly washed. A method of restoring them was suggested some time ago by Mr. W. E. Debenham. A solution is made of Schlippes salt (sodium thioantimonate) ten grains to the ounce of water. First soak the film in water and then immerse in the restoring solution until the necessary effect is obtained.

S. A. M., Detroit, Mich : You will find the following an excellent metol-hydroquinone developer.

A

Hydroquinone	55 grains
Metol	45 grains
Metabisulphite of potash	120 grains
Potassium bromide	20 grains
Water, to	20 ounces

B

Washing soda	2 ounces
Water, to	20 ounces

Use equal parts of A and B for short exposures. Bromide of potassium may be added in cases of overexposure.

H. C. B., Los Angeles, Cal.—To remove a tight stopper put two or three drops of paraffin oil in the recess between stopper and bottle. This will in a short time insinuate itself in the "sticking place," and the stopper can be removed. By tapping gently all round the neck with a light wooden handle the stopper will sometimes give way. Another method is to wrap a cloth dipped in hot water round the neck.

J. C. R.—The "Encyclopædic Dictionary of Photography" will shortly be published in book form complete. The publishers already have orders for a large number, and as the edition will be limited we would suggest your booking your order at once.

W. C. McN.—The three hundred illustrations to the 1898 "Annual" were selected from over 5,000 submitted. We are pleased to hear you like the selection. They are not all such as we care for ourselves, but in a work of this kind, read by over 20,000 persons, we naturally have to vary the contents as much as possible, as tastes differ so much.

A. J. L., Tacoma.—The best method of preventing the cracking of the condensors in your enlarging lantern by the heat from the light source is to insert a tank containing a saturated solution of alum. While, of course; this reduces to a slight extent the illumination it absorbs the heat rays and saves the condensors.

G. H. S., Nashville, Tenn.—A good formula for a negative varnish is the following :

Shellac	2 ounces
Sandarae	1¼ ounces
Camphor	10 grains
Alcohol	20 ounces

After the ingredients have been properly dissolved allow the solution to stand for several days. Then filter.

R. P. S., Salt Lake City, Utah.—Bellitzki's Ferrous Oxalate Reducer is made up as follows :

Water	7 ounces
Potassium ferric oxalate	2½ drachms
Crystallized neutral sulphite of sodium	2 drachms
Powdered oxalic acid, from	30 to 45 grains
Hyposulphite of soda	1½ ounces

The solution must be made in this order, filtered, and be kept in tightly-closed bottles ; and as under the influence of light the ferric salt is reduced to ferrous, the preparation must be kept in subdued light

S. H. S., Chicago, Ill —If you have already permitted your picture to be published in some magazine it would be useless to copyright it now.

OUR COMPETITIONS

Competition No. 12.—Domestic Pets.

For the best photographs of domestic pets we offer:

First Prize—A Silver medal.

Second Prize—A bronze medal.

Competition No. 13.—Illustrated Cycle Routes.

For the best account of a tour with cycle and camera illustrated with not less than twelve photographs, we offer:

First Prize—A silver medal.

Second Prize—A bronze medal.

Competition No. 14.—Home portraits.

For the best photograph of a pretty American girl, made in her own home with natural surroundings, we offer:

First Prize—A silver medal.

Second Prize—A bronze medal.

RULES.

RULE 1.—All entries must be forwarded to Editor PHOTOGRAPHIC TIMES, 60 and 62 East 11th Street, New York, and marked "Competition."

RULE 2.—No indication of the competitor's identity to be placed on the competing pictures. A *nom de plume* (initials debarred) should be written on the back of the picture, and a sealed envelope containing the name and address of the competitor, together with a few particulars regarding the photograph and any other details of interest, should also be sent, upon the outside of which the *nom de plume* must be clearly repeated.

RULE 3.—The competition to be an open one. Any number of pictures may be sent, but each one must be accompanied by another sealed envelope and a different *nom de plume* used in each case.

RULE 4.—All pictures for competition must be sent prepaid.

RULE 5.—The whole of the work entered must be the work of the competitor, that is to say, the exposure, development, printing, toning, mounting, retouching, and finishing.

RULE 6.—The prints must be mounted. Framing optional.

NOTES.

All the rules given must be strictly adhered to or the competitor will be disqualified.

Absolute discretion will be placed in the hands of the judge or judges, but we reserve the right to adjudicate on any question outside the actual judging.

Awards will be withheld if the judges decide that the work is not sufficiently meritorious. The possession of a PHOTOGRAPHIC TIMES Medal will, therefore, be a guarantee of a high order of merit.

The editor reserves the right of publishing reproductions of any of the photographs submitted.

No competitor shall receive more than one prize.

Pictures may be of any size or shape.

Any photographic process may be employed.

Pictures entered for competition will not be returnable.

The last day for receiving entries will be January 31st. The awards will be announced as soon after as possible.

SUNSET ON CHESAPEAKE BAY BY H. A. BEASLEY

PATENTS OF THE MONTH.

GRANTED DURING THE MONTH OF DECEMBER, 1897.
(FURNISHED FOR THE PHOTOGRAPHIC TIMES BY WILLIAM S. HODGES, PATENT LAWYER, WASHINGTON, D. C.)

595,036. **Photographic Camera.** Edmond Bloch, Paris, France.

The case of the camera is made in the form of a binocular, a storage compartment for sensitized plates being formed in one tube of the binocular and main parallel lenses arranged in the other tube, the focal axis of said lenses being perpendicular to the longitudinal axis of the binocular. A finder and an ocular are also suitably arranged. A Shutter is formed as a section of a cylinder and rotates about the longtitudinal axis of the lens tube, an adjustable spring being arranged to throw said shutter at varying rapidity. Dogs are arranged to hold the shutter at the extreme limits of its motion in either direction.

595,285. **Magazine Camera.** Peter Berggren, Lake City, Minn.

An outer casing is divided into two compartments by a partition, reservoirs being positioned in each of said compartments and communicating with each other through the partition. Racks are arranged upon the reservoirs and the notches thereof are engaged by dogs carried by suitable levers pivoted to the inner side of the casing. Means are provided for operating the levers in such manner as to cause the dogs to successively engage the teeth of the rack for moving the reservoirs.

595,369. **Timing Apparatus for Photographic Printing.** Emil Buhler, Schriesheim, Germany.

A lamp is arranged within a suitable casing and provided with a second casing located in front of the burner thereof. A flap is arranged in the latter casing and adapted to keep the light emitted by the lamp off the other casing. A third casing forms a spiral way and is provided with a ball adapted to roll down said spiral way and engage a lever connected to said flap.

595,468. **Photographic Camera.** W. F. Cook, Ivy Mills, Pa.

The camera casing is made into two sections, one of which is arranged to telescope into the other. A lens, shutter, and focusing device are carried by the telescoping section and a removable film carrying frame is carried by the main section. Film rolls are journaled in said frame and devices are arranged to guide the film to a point in line with the lens.

595,551. **Photographic Camera.** John L. Atwater, Western Springs, Ill., assignor to the Vive Camera Co., Chicago, Ill.

In connection with a camera box the inventor employs a flexible changing sleeve open at both ends, the inner end being attached to the box under the lid. The lid is adapted to shut down over the sleeve when the latter is drawn out so as to exclude the light while inserting the hand into the sleeve or withdrawing it therefrom.

595,591. **Magazine Camera.** John L. Atwater, Western Springs, Ill., assignor to the Vive Camera Co., Chicago, Ill.

A rectangular light-tight camera box is arranged with a three-sided metal shell which latter is provided with a groove for a rigid backing plate provided with a spring, and formed with a shoulder at each side for the plates to abut against. Means are provided for moving said shell to and from the lens from the exterior.

595,621. **Kinetograph Camera.** Paul Gautier, Paris, France.

This is an intermittently moving apparatus for taking or displaying photographs, and is provided with clockwork driving a crank which is connected to a pawl lever by a link. Said lever engages a ratchet wheel on the axis of a pinned cylinder moving the film and is arranged to disengage, as the link ascends, a second lever having a pawl which engages an oppositely toothed wheel on the axis of the cylinder. Said second lever operates, as the link descends, to move the cylinder one tooth to a position in which during the ascent of the link it is held by the second pawl and by a third pawl preventing back movement.

595,812. **Method of and Apparatus for Converting X-Rays into Light for Photographic Purposes.** T. B. Kinraide, Boston, Mass.

The inventor claims a method of taking an X-ray radiograph by interposing the object to be copied, and a photographic plate or substance between the sourse of the X-rays and a surface or converter which transforms the invisible X-rays into light. The apparatus consists of a base provided with a plane surface translucent to X-rays, said surface having a coating or composition of material capable of transforming the invisible X-rays into visible actinic light.

TRADE MARKS.

30,934. **Photographs and Photographic Pictures.** Theodore C. Marceau, San Francisco, Cal.
The word "Renaissance." Used since May, 1897.

30,967. **Photographic Papers and Chemicals.** Nepera Chemical Co., Yonkers, N. Y., Chicago, Ill., and Paris, France.
The word "Nepera." Used since January 4th, 1894.

31,002. **Photographic Supplies.** Vive Camera Co., Chicago, Ill.
The word "Vive." Used since June 1st, 1896.

31,058. **Sensitized Developing Paper.** Nepera Chemical Co., Yonkers, N. Y., Chicago, Ill., and Paris, France.
The word "Velox." Used since August 6th, 1895.

fully coalesce, by which means the dot remains open, so that the square stops--even if their ratio aperture may not be so great as that of the round ones--it is easier to obtain undulated half-tone negatives. Square stops with the corners cut out I especially recommend for half-tone work; the beginner should commence his experience with such a stop. The influence of the diagonal aperture is to present the dots in lines, and this will be more readily observed if one-half the time allotted to this form be given the one way, and the diaphragm turned round so as to give it in the other direction. These special diaphragms may be made in cardboard and blackened.”

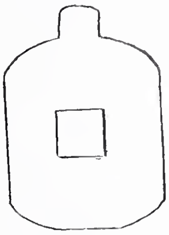


FIG. 373.

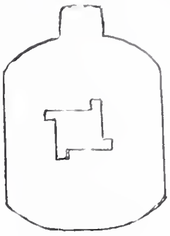


FIG. 374.

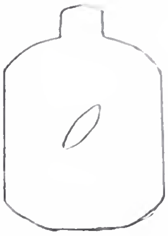


FIG. 375.

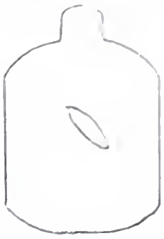


FIG. 376.

The Copying Board.—The copying board should be so placed as to be conveniently shifted to accommodate any reduction or enlargement that may be required, but at the same time retain its being in position perfectly vertical to the camera holder. This is secured by being erected on the same platform as the camera, and running in the same grooves, as explained in the foregoing diagram. The copy may be affixed in any way convenient, only where special means have to be adopted to keep it flat, perhaps the simplest way is to place a piece of plate glass over it, for which it is as well to make provision, so it may be readily fixed and at the same time impinge with some pressure on the copy. With a couple of catches of thin brass at the bottom, to support the weight of the glass, into which a wedge of folded paper may be pushed to keep it tight, and pieces of spring brass at sides and top, secured with a screw at end, so that it may turn in any direction and hold, it will be found all that is needful (see Fig. 377.) In the use of a plate glass cover, however, it should be seen that no reflections proceed from it, and if there are, means must be taken to obviate them. And this leads us to the next important consideration, that of

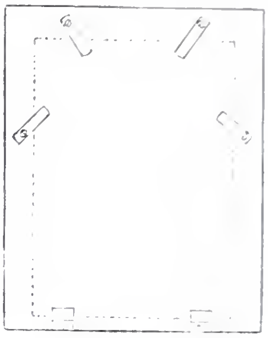


FIG. 377.

Light.—If you have access to the skylight of a photographer's gallery, or can erect such, you are all right, and have at hand a most potent assistance in securing suitable negatives with greater certainty and with less perplexing judgment. But you may be dependent on a side light from a window, with every variation of cloud and sunshine, rain or clear weather, while volume and intensity will also vary with the season, and it will call for the exercise of much study and waste from many trials on plates, and patience, to secure the exact conditions of a good negative. A northern light will give the most steady and have less variation, but more frequently one has to make the most of what he can get, and then it lies for the man of inventive parts to bring out good results from circumstances as he finds them. Direct sunlight may even be used, and good negatives secured by it with very much shortened time of exposure.

Exposure.—The varying circumstances of light--the fickle clouds and the uncertain haze, the meridian glare and the slanting ray of the morning and evening, as well as the summer's glow and the winter's mist--render the time of exposure a matter of exceeding difficulty, which experience only can overcome, and enable one to attain to the exercise of a just judgment. It may be mentioned, however, that an exposure through a screen for a half-tone negative will take about four times that of a negative intended for line work. Before uncapping the lens examine the conditions of the light, and determine what stops you will use, and mark down on a slip of paper the time you intend to give to each, then turn the hands of a striking clock to the time allotted to the first stop, and the instant of its striking will give a perfect warning that time is exactly up, when the lens may be capped and the stop changed, and the clock again set to keep its vigils for the fullness of time.

Exposure Example.--As an example of approximate timing, we will suppose a picture to be copied, and to be reduced to about one-half. Referring to what has been said regarding stop apertures on p. 408, we would use that marked No. 1, or a round aperture of same size, say *f*/75, and give seven minutes; then change to No. 2, *f*/50, and give two minutes; change again to Nos. 3 and 4, same size, and give one minute each; being eleven minutes in all, with a fairly clear light, through a screen of 120 lines to the inch, and with a rapid rectilinear lens of a reputable make. The light, or other circumstances, may call for a different exposure, but this is given as an example that will be found nearly correct.

The Developer.--Make a saturated solution of the proto-sulphate of iron, of which take twelve ounces, and add to it two ounces of acetic acid and twenty-four ounces of water. Some add a little alcohol, but this is not necessary unless the silver bath is getting out of order from use, or the accumulation of iodide, alcohol, or organic matter in it, which may be known by a difficulty in flowing the developer over the plate, and may be accepted as a warning to see after a new bath, and an early rectification of the old.

The Fixing Chemical—The agent used to fix the picture, or destroy the sensitive character of the plate, is the cyanide of potassium, made up in solution in the proportion of one ounce of cyanide to twelve ounces of water. It is highly poisonous and should be carefully kept from any scratches or abrasions on the hands, and so save any risk of blood poisoning.

Development.—The exposure made, retire with holder to the dark-room, which we have supposed to have been fitted up with sink, water, and the usual necessary equipment of such "dens." The developer and the fixing chemical are supposed to be lying convenient to hand. Take the plate from the holder, and, holding it by the corner in the left hand, flow the developer with a steady and rather copious sweep over it, yet permitting as little as possible, or none, to overrun. Flow back and forth until the appearance of the image, which, if correctly timed, should be in a few seconds, and watch for the coming of the details of the picture, and on the instant that they are seen to be sufficiently full, stop further development by putting the plate under the tap, and letting the water flow freely over it. Guard against over-development. If allowed to go too far there will be a veil or fog over the plate, which it is difficult to get rid of, with great risk of spoiling the negative in the attempt.

Trimming the Negative.—The development having been carried as far as desired—*i.e.*, with the detail fully out, but no more—and washed with a generous flow of water, it is now ready for being "fixed," that is, the image rendered non-sensitive to the light, which is done by flowing over the plate the before-mentioned solution of cyanide of potassium, when the whole picture will be seen immediately to clear up. Before doing so, however, it is well to trim up the negative by scraping away with the thumb the film from the outer margin of the picture, allowing about an inch or so to remain. As the film is very rich in silver, a small receptacle should be provided, easily found in the dim light of the dark-room, where that portion scraped off may be put and preserved.

Examination of the Negative.—The plate may now be taken into the light and examined through a microscopic focusing glass, and the attention first directed to the condition of the dots seen in the high lights, *i.e.*, the dark portions in the negative. These will have come right, if they almost, but not quite, touch each other, while the dots in the half-tones will be of size varying as they tend to light or shade, and the deeper shadows will have smaller dots, but sufficiently pronounced to permit a little diminution in the after process of clearing. Should the high lights not be closed enough, and instead show considerably wide cross lines, then a longer exposure with the larger stop, or possibly increasing the distance a trifle between the screen and plate is indicated. If the dots in the shadows are not sufficiently strong, then a smaller stop, or a longer exposure with the smallest stop used, is the remedy. Keeping these rules in mind, with a little practice, the operator will soon master the principles and attain familiarity in working.

Intensification.—However well defined the image may appear on the plate at this stage, it is never so clear as that a satisfactory plate could be engraved from it. It requires to be "intensified." To do so there are two methods that may be adopted, both of which have their advocates. One of these uses the bichloride of mercury as the agent, the other employs a solution of the sulphate of copper and bromide of potassium with nitrate of silver. The formula and operation with the first are as follows:

Bichloride of mercury	2 ounces
Muriatic acid	½ ounce
Water	25 ounces

Allow the plate to remain in this solution till it is bleached white, when it should be well washed in running water, and then flowed over with the following:

Hydrosulphuret of ammonia	1 part
Water	4 parts

This will make the plate an intense black. After being well washed it should be flowed over with a weak solution of nitric acid, in the proportion of 1 drachm to 4 ounces of water, well rinsed under the tap and set aside to dry. It should be mentioned that the bichloride of mercury is the well-known corrosive sublimate, a deadly irritant poison, and should be used with extreme caution.

The formula and operation with the other method are as follows:

Sulphate of copper	25 grains
Bromide of potassium	15 grains
Water	1 ounce

Flow this solution while the plate is held in the hand. It will at first discolor or darken the film, but in a few seconds will bleach to white. After it has whitened through, let the tap flow over it till thoroughly washed, which will take about five minutes. The washing should be uniform all over, and if allowed to lie under the tap the water should be directed in an equal stream over all parts. It should then be flowed over with the following solution:

Nitrate of silver	40 grains
Citric acid	8 grains
Ice or distilled water	1 ounce

Under this application the plate will blacken over, when it should be again thoroughly washed.

Clearing the Negative.—It is more than probable that it will not yet have been sufficiently cleared to print, in which case it should be flowed with the following solution of iodine :

Iodine	40 grains
Water	4 ounces

with iodide of potassium added in small quantities at a time and shaken until all the iodine scales are dissolved. This will be of a deep brandy color. After allowing this solution to act upon the film a few seconds, it should be well rinsed in water under the tap, and flowed with a *very* weak solution of cyanide of potassium, which will instantaneously whiten over the film, and the image will be seen gradually to clear up. Great caution, however, is needful in this operation. Should the cyanide be too strong, or allowed to act too long upon the film, it will sweep away the dots in the shadows or cut away so much as to render the negative valueless. The tap should be kept running while operating with the cyanide solution, ready to stop its action the instant it is seen to clear up. If an examination reveals that it is not yet sufficiently clear, the operation may be repeated. Should any part be seen to require clearing more than another, a small stream of the cyanide solution may be so poured from the graduate as to be directed on the clouded part without reaching the rest, though to do so will require delicate handling and much caution, as, a little overdone at this point, the whole negative may be spoiled. When seen by examination with the focusing glass to be sufficiently cleared with the cyanide, it should be again well washed, flowed with the foregoing weak solution of nitric acic, and afterward blackened with the solution of sulphuret of ammonia mentioned above, flowed again with the nitric acid, washed and set aside to dry. Wash well after flowing with all the solutions.

Features of a Good Negative.—It is to be hoped that the result of so much labor, necessitating so much careful handling, and the exercise of so much judgment, will be a good negative. If it is not satisfactory it will be but labor lost to proceed further, and it will be well at this point to describe what constitutes a good negative. Give it a minute examination under the glass. The darkest portions of the negative, which will be the high lights in the finished picture, should present a small, clear, transparent dot. The effect of the intensification should have been to close up the black dots which, after development, almost touched. If there are cross lines of white instead of the small dot, the high lights in the finished picture will be correspondingly dark and the whole effect will lack contrast and pluck. The black dots in the half-tones should vary in size down to the very small in the deeper shadows, and where strong contrast is wanted they may in some portions be down to nothing. Should the finished negative not present these features, it were better, in the spirit of *nil desperandum*, to throw it aside, and begin again at the beginning, hoping for "better luck next time."

The Marginal Line.—The resulting negative proving satisfactory, the further operations may be proceeded with, and the next, unless a vignetted effect is wanted, a marginal line should be run around the picture, giving it a finished appearance, and affording a guide for the router in mounting. With a square or straight edge laid along the margin of the picture, run the point of a graver along; this will make a clean cut through the film, which will print black in the finished picture.

Turning the Film.—The film has now to be prepared for turning, otherwise the picture would appear reversed in the after printing. Though to turn it is by no means a difficult operation, it requires delicate handling, and is most interesting. To enable its being so turned it is first giving a coating of india-rubber dissolved in benzole, made as follows : Cut half an ounce of pure virgin rubber into small pieces, and place in a bottle with about 8 ounces of benzole, giving it a good shake occasionally. In a few days it will dissolve. It should be about the same consistency as good collodion, and if found too thick it may be thinned by the addition of more benzole. It must not be too thin, however, otherwise it will not be sufficient to resist the action of the collodion which is to be afterward applied and which would eat away and destroy the film. After the benzole has evaporated and left the rubber in a thin layer dry over the film, it must be flowed over in the same manner with "stripping" collodion, made after the following recipe :

Alcohol	4 ounces.
Pyroxyline	60 grains.
Sulphuric ether	4 ounces.
Castor oil	30 drops.

The castor oil is added to make the film adhere to the glass after being turned. It is ready for turning any time after the collodion has set and dried.

At this stage the film should be cut through with a sharp knife about a quarter of an inch from the line marking the margin of the picture. It is now to placed in a solution of acetic acid, of quantity sufficient to cover well, and proportioned as follows :

Acetic acid	1 ounce.
Water	8 ounces.

In a few minutes the film at the outer edges will readily be picked away by raising it at the corner with a penknife. After stripping away the outer portion, and leaving only the picture on the glass, put under the tap and wash well, but carefully, and lay on a table, with plenty of water upon it. Now take a piece of stout common printing paper, somewhat larger than the picture and within the size of the glass; wet it by drawing it through water, and lay it over the film; next squeegee the water from till smooth, raise the corner, and with the point of a penknife pick up the corner of the film, just enough to catch hold of it between the finger and thumb, keeping the paper for support, and gently pull both together from the glass. It will readily come away. Lay it down upon the glass, film up, and smooth out gently with the squeegee, or the point of the fingers, any wrinkles that may have come on it. If the wrinkles are numerous, or the film too delicate to handle with the squeegee or the fingers, a gentle flow of water will expedite the operation, being cautious, however, not to flow so sharply as to float it off! Now draw another piece of paper through water, and lay it over the film, squeegee again, and lifting both papers, having the film between them, from the glass turn right over, and remove the first piece of paper, which will now be uppermost. The film may now be lifted with its paper support and set aside, and the glass thoroughly cleaned under the tap. So cleaned, lay the glass on the table with plenty of water, lay the film, with its paper support uppermost, in the center, and squeegee the water from it. The paper may now be lifted and the film examined and smoothed out gently with the squeegee, and the paper replaced over it. With two or three layers of blotting paper over it, it should be placed under a board and a weight for about half an hour, when it may be taken out and set side to dry.

Preparations for Etching.—The negative is now ready for being printed from, and the student's attention will now be directed to the preparation of the metal plate for etching. This may be either of zinc or copper, the choice being determined by circumstances, it may be of economy or otherwise. It has been maintained by many excellent operators, especially in England, that one metal is as good as another, so far as the final results are concerned; but an examination of the work in America will satisfy an unprejudiced scrutiny that finer effects have been obtained on copper. It is possible that different ideas of what constitutes excellence in an engraving may account for the preference. It will be noticed that the American workman seeks after strong contrasts of light and shade, and, not content with that which his negative can supply, has recently resorted to putting the strong lights in with the graver, and by rubbing down the dots has strained after deeper blacks in the shadows. Our cousins on the other side evidently seek after softness of general effect, and by their writings on the subject show that they esteem this as the acme of attainment. Whichever metal is chosen, however, it must be perfectly polished. It may be purchased in several grades of preparation, rough, machine polished, or highly buffed. We think it the best economy to get at least machine polished, and we will assume that it has been so procured.

Polishing the Metal.—If the metal chosen be zinc, it may be brought to a good polish under charcoal and water, but with copper it is necessary to give it a fine grain with emery and charcoal and water, and lastly with charcoal and water alone. In polishing on either metal, let the rubbing be done all one way, to and fro, not in circles or across. After a partial polish, it is well to put it for a few minutes into a strong lye, to overcome any greasiness; and the hands should be perfectly clean, and the fingers not allowed to touch the polished surface of the plate for the same reason.

The Enameling Solution.—The plate being well polished, it is now ready to receive the enameling solution. For this there are various formulæ, each supposed to have merits of its own, and hedged around with all the importance of mysterious secrecy; but the bases of all is a glue or gum, preferably Le Page's fish glue, which is now specially refined and clarified for the purpose, while the sensitizing element is the bichromate of ammonia. To these most operators add a proportion of albumen, and the varying proportions of these ingredients constitute the virtues of the so-called secrets. Some, however, discard albumen, and as the presence of this prevents the keeping quality of the solution, it should only be made up in small quantities for early use, or not more than will suffice for a week or two's work. That made without albumen may be made up in larger quantities, as it will keep indefinitely; but it necessitates more careful washing out after development, the albumen, when used, washing out more readily. We give both formulæ, that the operator may take whichever, after practical experiment, he is most successful with.

Le Page's clarified fish glue	2 ounces
Bichromate of ammonia	120 grains
Albumen	2 ounces
Water	6 ounces

The whites of four eggs of medium size will yield the above quantity of albumen, which take, carefully excluding the yolk and the germ, and thoroughly beat up and set aside to settle. Grind the bichromate with the water, mix with the glue, and add the albumen, and beat up the whole again. A common domestic egg-beater is very suitable for this purpose. Make the mixture up in non-actinic or feeble light, and set aside for several hours, when it should be filtered through a small piece of fine sponge in a large funnel, and put into a stock bottle, and again filtered in the same manner before using.

The formula without albumen is as follows :

Clarified fish glue	3½	ounces
Bichromate of ammonia	30	grains
Water	10	ounces

The directions for making giving above will apply equally to this. They should be tested with litmus paper, and will more than likely be found acid. Neutralize with a few drops of concentrated ammonia.

Sensitizing the Metal Plate.—The plate having been cleaned and polished, let water from the tap freely flow over it, and, slightly draining the surplus, pour a portion of the solution on at the upper right-hand corner, when it will sweep the water from before it. The solution will have been filtered through a sponge and convenient at hand in the graduate. Flow a second and a third time. Let the surplus at the first flowing run into the sink ; if that of the succeeding flowings are thought worth the saving, do not catch them in the graduate from which the solution was poured, but in some other, because so doing will cause air bubbles to form, which will be sure to cause trouble afterward. At the last flowing retain enough to flow back over the plate, and, keeping it in a level position put it into the "whirler," and whirl, at first with a slow motion, and gradually increasing in rapidity for a minute or so, when it should be examined for any specks or air-bubbles that may appear on the film. If there are any seen it is a misfortune; should they be air bubbles, they may be pricked with a needle, and in the after flowing they will disappear ; but if they arise from dust the easiest way is to polish over again and begin from the bottom. These specks are sometimes unaccountably troublesome, and may result from acidity of the solution, so that it is well to prove it with litmus that it is in a neutral condition ; if from air-bubbles, the best preventative is to keep the point of the funnel through which the solution is filtered resting on the bottom of the graduate ; if they are from dust, it is obvious that the room requires sweeping out, or even the floor mopped and washed out, and to remember that cleanliness is an essential to success. If there are no such manifestations, flow again with the solution, and this time let the whirler be so arranged that a gentle heat may be applied, so it may be dried as quickly as possible. This may be conveniently done by holding the whirler over a gas stove, or other cleanly heat, and whirl in the same manner as before, which should take about three minutes. Care must be taken, however, not to expose to extreme heat—indeed the less the better—otherwise the albumen may become coagulated, in which condition it would not wash out in development. The plate may now be set aside to cool, and others coated and sensitized, or made ready for printing. Of course, the coating of the plate, it will be understood, is to be done in the dark-room, or with subdued light, and until time of printing set in a dark cupboard or other receptacle.

The Whirler.—The whirler may be of any form that will impart to the plate a rapid circular motion, the idea being to obtain by centrifugal action a perfectly equal distribution of the solution over the plate. Perhaps the simplest form of whirler we have ever known being used was that of a cord suspended over the stove, and twisted till the strain, on being relieved, gave the desired motion, on the principle of an old time cook's roasting jack. Such makeshifts, however, should only be resorted to by the genius who finds himself in a corner, and, nothing daunted, is determined never to stick. We give in the following diagrams the forms of two of the most frequently used. The working of the first will be readily understood from the drawing ; that of the other we may describe as being made of hard wood, the long arms of thin hickory about 18x4¼ inch, around which is placed a broad rubber band. Being of such thin material the arms will spring out to suit almost all size plates within its capacity. The plate is held within grooves at the extreme end, or, what is better by small screws placed on the outer edge, the heads of which, holding the plate outside, allows the solution to flow uninterruptedly away under the motion. The diagram will explain how the motion is imparted, and it will also be seen that this form of whirler is very convenient for holding in the hand over the heat and at the same time whirled rapidly by the small handle at the upper end.

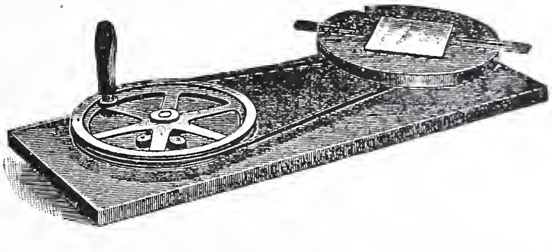
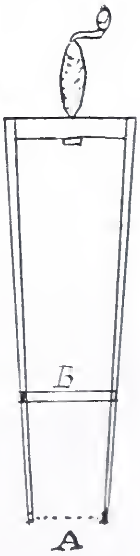


FIG. 378.—FORM OF WHIRLER, NO. 1.



The dotted line indicates the plate in position at A ; B, the rubber band.

FIG. 379.—FORM OF WHIRLER, NO. 2.

Preparations for Printing.—The plate is now ready for printing. To this end let the thick plate glass of the printing frame be seen to as being thoroughly clean, also the negative. Frequently a moisture will collect on the glass of the negative. Frequently a moisture will collect on the glass of the negative, to obviate which let it be held over the gas stove for a few seconds.

As to the printing frame, it is scarcely necessary to describe it more than in a general way, that it is a square frame about four inches deep, in which is placed a piece of plate glass of from three quarters to an inch in thickness, of sufficient strength to withstand the pressure necessary to secure complete contact between the negative and the metal plate. This pressure is got from screws, as will be seen in Figs. 380 and 381. The frame must be purchased anyway, and its construction and working will be readily understood when practically examined.

Loading the Printing Frames.—Take the sensitized metal plate and rest on the points of the fingers of the left hand, and place the negative over it so as the picture will fall exactly in the center; or lay the negative in the printing frame, film side up, and lay the sensitized plate over it. Let this be done gently and without moving about, so as to save any risk of abraiding the film of the negative. Turn over and convey to the printing frame; place over them one or two pieces of felt; put on the cover, and proceed to screw down. This must be done very carefully so as not to break the negative. The safest way is to bring a gentle pressure to bear upon the centre screw, and on the others radiating from the center, and lastly on the corners, repeating this gently, always beginning at the center and going over the others until close contact between the negative and the plate is obtained.

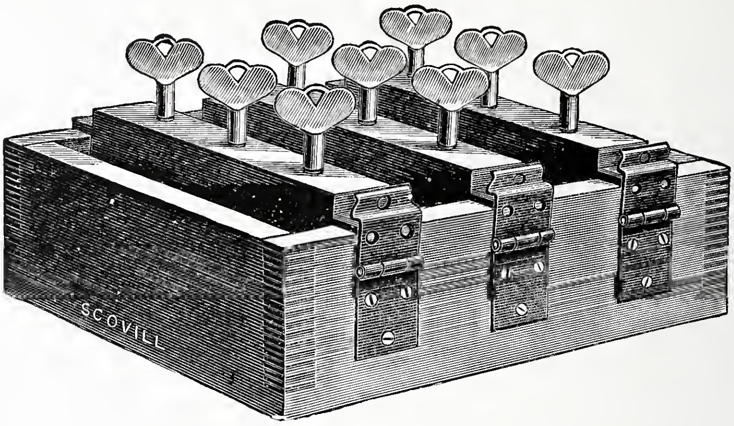


FIG. 380.—PRINTING FRAME, CLOSED.

The Printing.—The plate is now ready for exposure, with a view to printing; and here judgment and experience, the outcome of experiment, must be the best guide of the student. There are two elements on which he will have to bring his judgment to bear: first, the density of the negative, and, secondly, the intensity of the light. It may take anywhere from one to ten minutes. If a bright sun is out, and the negative of medium density, one minute may be ample, varying with a cloudy sky or a hazy atmosphere. A few practical experiments and the waste of a few plates will afford better lessons than any written words can convey, and knowledge will come as the reward of patient perseverance.

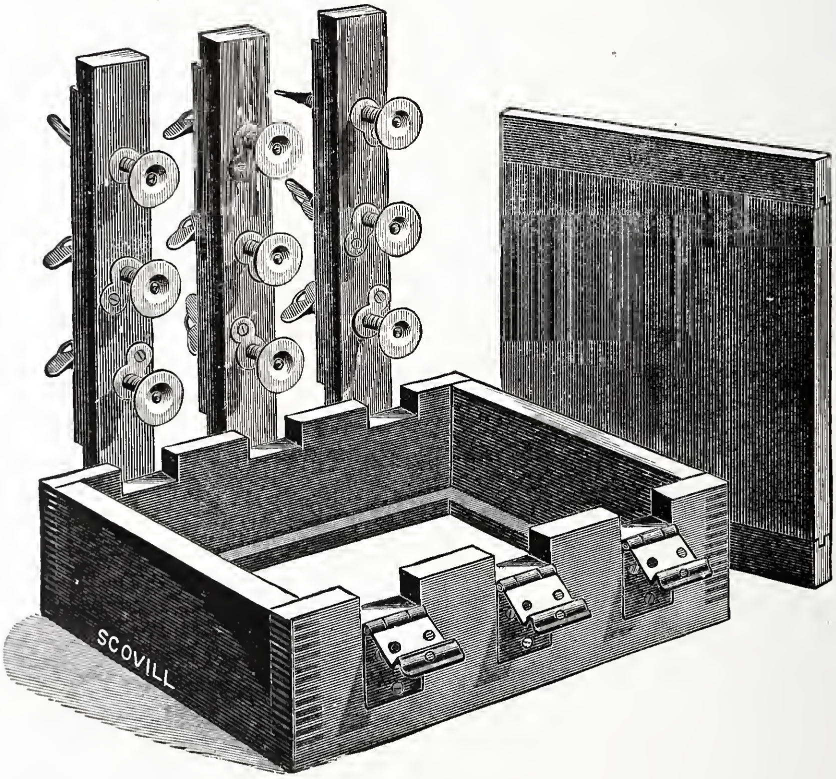


FIG. 381.—PRINTING FRAME, OPEN.

Development. — Having given what is deemed to be a sufficient exposure, remove the printing frame into the darkroom, unscrew and take out the plate, and place in a dish of slightly warm water, and rock for a few minutes. At this point it may be examined as to whether a correct exposure has been given. If so, the enameling solution will be found a little tough when raised by the finger-nail at any of the margins. If the time given has been too short, it will have washed away under the action of the water, especially when placed under the tap to wash out, which should now be done. If correctly timed it will stand considerable washing without injury. The effect will have been to wash out those parts of the solution which have been protected from the light by the denser portions of the negatives, and the half-tones in varying proportions.

Drying after Development.—Having been sufficiently washed, the drying may be accomplished by being set aside and allowed to dry spontaneously, or, as the manner of some is, to to reach the end more expeditiously, the plate may be flowed over with alcohol, and, held in tongs or pincers, a flame set to it, when it will be dried at once and be ready for the next operation, which is the burning in.

Burning In.—This operation is best performed over a small gas-stove, and requires a pair of large pincers, about twelve inches long, with broad point that will hold a good grip of the plate by the margin of the picture. It must be kept moving over the flame to and fro, so as to distribute the heat gradually and regularly over all the plate. In a few minutes it will be seen to change color and the picture to develop out more plainly. At this point it is safer to lay aside for a few minutes to partially cool, as a great heat too quickly brought to bear upon the enamel may cause it to crack ; meanwhile, other plates may be proceeded with and brought to the same stage. The burning should be continued until it assumes a rich deep brown, when it should be laid aside to cool gradually, when it is ready for the etching.

Corrections on Film.—Specks and other imperfections will now probably make their appearance, which had before been unsuspected, brought to light by the burning in of the enamel. The plate should, therefore, be examined under the magnifying glass and these corrected with a fine engraver. They will appear most injuriously in the high lights, and the remedy is to trim away the film between and so relieve the dots. This is rather a delicate operation and takes careful handling.

The Etching Fluid.—The etching fluid for copper is a solution of perchloride of iron. It is advisable to use it at full strength at first, gradually diluting. It is a curious fact that the strength of the solution is to a certain extent increased by the addition of water. Make up sufficient to cover the plate well but not so deeply as to prevent seeing its action in etching. A serious objection to using the fluid full strength is, that it is so opaque as to prevent the process of etching being observed and watched.

The Etching.—Pour the solution of chloride of iron into a shallow dish and insert the copper plate. The action of the iron will be at once seen in a change of color, resulting from the accumulation of sediment from corrosion. Brush this off with a soft camel's hair brush, and do so with a light circular motion rather than broad sweeps over the plate. Do so every half minute or so, when it is seen to accumulate over the plate. Occasionally blow the liquid from some part of the surface and keep a keen watch whether any of the dots show signs of etching away, when it must be at once stopped. Should the enamel give way too readily under the etching it was probably too acid, or the exposure under the printing frame had been too short, or the burning in not carried far enough. It may etch deep enough in five minutes to print well, but it is better, for giving greater ease in making ready at press and better printing results, to give a deeper etch, and if the enamel does not show signs of giving way, fifteen minutes may not be too long to give it. The progress and depth may be examined by the finger-nail upon the margin and stopped when it is judged far enough ; then taken out and brushed well with the camel's hair brush under the tap, then dried by gentle heat over the stove.

Enameling the Zinc.—Should zinc be the metal chosen to work with, nitric acid is employed in etching. Zinc plates, readily polished and prepared for engraving purposes, may be obtained, and it is greatly preferable to so purchase them than undertake the labor and trouble of polishing. It must, however, get a final polish with engravers' charcoal before flowing with the enamel solution ; and to eradicate any greasiness on the surface it may be placed for a few minutes in the lye used for cleaning the glass plates, and then given the final polish. The process of flowing the plate with the enamel solution is exactly similar to that described above for copper; but in burning in, the zinc, being a much softer metal, will not stand the amount of heat that copper does, and so the enamel cannot be burned to so deep a color, and, therefore, greater caution is required to burn to a degree sufficiently hard and yet not bring the zinc to the melting point.

Etching on Zinc.—A very weak solution of nitric acid is all that is necessary in etching half-tone work on zinc. A solution of 1 drachm acid to 10 ounces of water, which will to taste be about the strength of vinegar, will be found right. It is usual to use a rocking tub, in which the plate is placed and the solution flowed over from end to end, while the oxidized zinc is gently brushed away ; it may be done quite as well, however, in a small porcelain or other flat dish as with the copper plate, and the same watchfulness of the film under the action of the acid must be exercised.

The Etching Tub.—The construction of the rocking tub for zinc etching will be readily understood by the following illustration of the latest and most improved form :

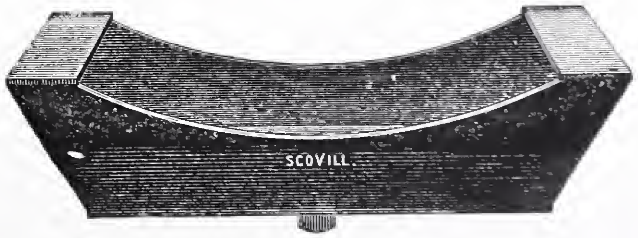


FIG. 382.—ETCHING TUB.

All that than remains is to mount the plate on wood to the height of type and take an impression from it on the printing press.

PROOF SPIRIT.—This term was originally employed to denote alcohol just strong enough to ignite gunpowder when poured over it and fired. A mixture of about equal parts of distilled water and absolute alcohol. It is defined by the Act 58 Geo. III., c. 28, to be "such as shall, at a temperature of 51° of Fahrenheit's thermometer, weigh exactly $\frac{12}{13}$ parts of an equal measure of distilled water."

Its specific gravity = ·9198 at 15°C., and it contains 49¼ per cent. by weight of absolute alcohol.

PROPENYL ALCOHOL.—See **Glycerine.**

PROTO-NITRATE OF IRON.—See **Ferrous Nitrate.**

PROTOCHLORIDE OF TIN.—See **Stannous Chloride.**

PROTO-SULPHATE OF IRON.—See **Ferrous Sulphate.**

PROTOXIDE OF LEAD.—See **Litharge.**

PRUSSIAN BLUE.—Ferrocyanide of iron. In the cyanotype process the image is formed in Prussian blue.

PRUSSIATE OF POTASH.—The red prussiate of potash is ferricyanide, and the yellow prussiate of potash is ferrocyanide of potassium.

PRUSSIC ACID.—Hydrocyanic acid.

PSYCHIC PHOTOGRAPHY.—See **Spirit Photography.**

PUMICE STONE.—A very porous rock of extreme lightness, chiefly exported from the Lipari Isles. It is a very useful substance. In the form of a powder it is used for polishing metals, woodwork, and for cleaning glass. It is also useful in removing stains from the fingers.

PUTREFACTION.—The apparently spontaneous decomposition of organic substances, especially those rich in nitrogen. It may be prevented (1) by keeping the substance in a vacuum; (2) by freeing from moisture and keeping perfectly dry; (3) by keeping in an atmosphere a few degrees below 0°C.; (4) by heating to boiling point and hermetically sealing; (5) by the use of antiseptics. According to Pasteur putrefaction only takes place when a substance comes in contact with living germs.

PYRO.—An abbreviated term for "Pyrogallol," or, as it is also termed, "Pyrogallic acid."

PYRO-AMMONIA DEVELOPER.—See **Developer.**

PYRO AND GLYCERINE DEVELOPER.—Edwards's formula is given under **Developer** as a pyrogallic developer for Isochromatic plates.

PYROCATECHIN (Formula, $C_6H_4(OH)_2$; synonyms, *catechol, oxyphenic acid, brenzcatechin, pyromorintannic acid*).—Obtained by the dry distillation of catechu extracted from the inner bark wood of the *Acacia catechu*, and also from *Kino*, another similar extract. The leaves of the Virginia creeper contain pyrocatechin. It is also obtained by fusing phenol-sulphonatic acid with caustic potash, and is present in crude pyroligneous acid, distilled from wood.

Pyrocatechin crystallizes in quadratic prisms soluble in water, alcohol, and ether. They fuse at 102° C., and boil at 245° C. In presence of alkalies it absorbs oxygen from the air, and becomes brown. Nitric acid oxidises it to oxalic acid. It is a reducing agent, and for this reason has been recommended as a developer for dry plates.

The first investigator was M. Benoist, who published his formula in *La Nature*, as follows:

SOLUTION A.

Distilled water	½ litre
Sodium sulphite	34 grammes
Pyrocatechin	8 grammes

SOLUTION B.

Distilled water	½ litre
Washing soda	75 grammes

Dr. Arnold's formula is as follows:

SOLUTION A.

Pure pyrocatechin	1 gramme
Water	100 c.cm.

SOLUTION B.

Sodium carbonate	20 grammes
Water	100 c.cm.

To develop a 10 x 8 plate take 1 c.c. of A solution and from five to ten c.c. of B in about 70 c.c. of water. For instantaneous drop-shutter work, more of solution A must be used.

Dr. Eder speaks highly of this developer, but notifies the importance of obtaining pure pyrocatechin. His formula is:

SOLUTION A.

Pyrocatechin	1 part
Sodium sulphite	4 parts
Water	40 parts

SOLUTION B.

Caustic potash	4 parts
Water	40 parts

For use, mix one volume of A with two volumes of B.

The advantages claimed for this developing agent are—freedom from fog, non-actinicity of solution, simplicity in preparation, high energy at low temperature, and a negative color that facilitates printing. According to Dr. Arnold, the plates lose their sensitiveness to light as soon as they are immersed in the developing solution, and may be developed at a distance of twenty inches from a gas flame, or in weak daylight. Further, the solution does not stain the fingers.

PYROGALLIC ACID.—A common but erroneous term for pyrogallol, which is not actually an acid. (See **Pyrogallol.**)

PYROGALLIC DEVELOPER.—Development with pyrogallol, or pyrogallic acid, as it is erroneously termed, in a solution with an alkali, is more general than with any other. One of the chief advantages with this form of developer is the power of the operator possesses of varying it to suit the requirements of the subject. Greater latitude of exposure is also possible with this developer than any other. Pyrogallol is usually kept in the solid state, preventing decomposition, but if required in solution it can be dissolved in a solution of sodium sulphite, slightly acidified with citric acid, and of such strength that the solution contains ten per cent. of pyrogallol. The darkening of the solution is thus prevented, as the sodium sulphite suffers oxidation instead of the pyrogallic acid.

Strong liquid ammonia, specific gravity .880, is mixed with nine times its bulk of water, so that every ten minims contains one minim of the ammonia. The potassium or ammonium bromide should also be made up as a ten per cent. solution. Sodium carbonate, if used, should be purchased in the dry state, and made up in a ten per cent. solution. Potassium carbonate should also be purchased dry, and can be made up into solution as strong as 50 per cent. if required. In making up these solutions the water must not be measured out but added to the solid until the solution measures ten times the weight of the solid used.

Sodium sulphite is usually made up as a 20 per cent. solution.

The pyro developer can be made up after hundreds of different formulæ. Every maker of plates usually recommends a certain one, and it is generally advisable to give this a trial for that kind of plate. These formulæ vary very considerably; for instance, one manufacturer of plates recommends

Pyro	Potassium bromide	Ammonia
6	$\frac{3}{4}$	5

and another

Pyro	Potassium bromide	Ammonia
3	7	12

The following is a table of the largest and smallest quantities of chemicals admitted to the pyro developer:

	Largest.	Smallest.
Pyro per ounce	10 grains	11.4 grains
Sodium sulphite	80 grains	5 grains
Sodium carbonate	40 grains	11.5 grains
Potassium carbonate	21 22.10	5 grains

For various formulæ for pyrogallic development, see **Developer.**

PYROGALLIN.—See **Pyrogallol.**

PYROGALLOL (derived from gallic acid and heat). Formula, $C_6H_6O_3$: molecular weight, 126; synonyms, *trihydroxybenzene, pyrogallic acid, pyrogallin, pyro.*—A trihydroxybenzene derived from gallic acid by destructive distillation, carbon dioxide being given off as one of the products of decomposition, thus:

$$C_6H_2(OH)_3.CO_2H=C_9H_2(OH_2)+CO_2.$$

It is prepared as follows: Gallic acid dried at 100 deg. C. is mixed with three times its weight of powdered pumice stone to equalize the heat, and distilled in a retort, through which a slow stream of CO_2 is passed, the retort being heated by an oil-bath between 210 deg. and 220 deg. C. A solution of pyrogallol, for use as a developer for photographic purposes, can readily be prepared by heating ten grammes of gallic acid with 30 c.c. of glycerine to 195 deg. C, so long as carbon dioxide is evolved. It is then made up with water to one litre. Of course, by this method the pyrogallol is obtained mixed with glycerine.

Pyrogallol crystallizes in fine needles felted together in light white tufts. It fuses at 115°C., and boils at 210°C. It is very soluble in water (1 in 2½ parts) and in alcohol and ether, and is more or less poisonous. Metagallic acid is sometimes present in samples of pyro, which have consequently a slightly brownish color, and leave a residue when dissolved in water.

If the solution be mixed with an alkali it absorbs oxygen from the air, turning brownish-black, and forming carbonates, acetates, and other products, a small quantity of carbon dioxide being evolved. It is a most powerful deoxidizer and reducing agent. Its action upon the silver salts causes it to be most extensively used as a developing agent. The reducing power of an alkaline solution of pyrogallol is in fact so great that it cannot be used alone, as the whole plate would be reduced, and we should get what is termed "fog." For this reason, therefore, a restrainer is added. The best for this purpose is a soluble bromide such as that of potassium.

Owing to the rapid oxidizing properties of pyrogallol solution it is very difficult to preserve. All of the following substances have been recommended for the purpose:—Formic acid, glycerine and alcohol, potassium metabisulphite, sodium sulphite, and citric acid.

PYROGENTISIC ACID.—See **Hydroquinone.**

PYROLIGNEOUS ACID.—An impure form of acetic acid obtained by the destructive distillation of wood.

PYROQUINOL—See **Hydroquinone.**

PYRO-STAINS.—Pyro-stains may be removed from the fingers by washing in a ten per cent. solution of oxalic acid or sulphuric acid diluted with water in the proportion 1 to 20, or a mixture of bleaching lime and citric acid.

PYRO-TABLETS.—Pyrogallol is sold in this form for the convenience of tourists. The pyro is compressed into tablets or cakes, each of which is scored into twenty-five 4-grain divisions which may be easily separated.

PYROXYLIC SPIRIT.—See **Alcohol Methylic.**

PYROXYLIN (Formula $C_6H_8(NO_2)_2.O_5$; molecular weight, 252; synonyms, *pyroxyline*, *dinitro-cellulose*, *gun cotton*). This name is applied to a series of compounds obtained by acting on vegetable fibres with nitric and sulphuric acids. They are all more or less explosive, and are all what are termed substitution compounds, being derived from the vegetable fibre by the substitution of atoms of NO^2 for an equal number of atoms of H in the fibre. The pyroxylin with which we have to deal with here is that known as the soluble kind, sometimes termed collodion wool, as is used in the manufacture of collodion for photographic purposes.

It can be purchased ready for use, and it is advisable to obtain it in this form, as its manufacture is attended with considerable danger.

The following directions are for preparing pyroxyline.*

The most important part is the composition of the nitric-sulphuric acid in which the pyroxyline is prepared, as the slighest variation in the quantity of water, in the relative proportions of the two constituent acids, or in the temperature at the time of putting in the cotton, will effect the result.

Sulphuric acid sp. gr. 1 854 at 60°F	18 fluid ounces
Nitric acid sp. gr. 1.45 at 60°F	6 fluid ounces
Distilled water	4½ fluid ounces

The water is poured into a dish, and the nitric and sulphuric acids added in the order written.

The mixture is then well stirred, and the temperature, which will have considerably increased on addition of the sulphuric acid, must be allowed to sink to 150° Fahr., and at this temperature it must be kept by means of a water-bath. The wool is first immersed in a strong solution of sodium or potassium carbonate to free it from the natural oil contained in it, and then well washed in clean water until the latter shows no trace of alkalinity or the salt used. It is then dried. The wool prepared in this manner should be weighed out in balls of about thirty grains each, and these are immersed one by one into the acid mixture, and well stirred in it, so that each ball becomes thoroughly saturated with the acids. They are then left for ten minutes and removed and washed in a running stream of water for twenty-four hours, or until they give no acid reaction when tested with litmus. They are then dried in the sun or on a water-bath. When dry they form the collodion wool of commerce, and should be entirely soluble in a mixture of equal parts of alcohol and ether. They should also be inflammable. The nitric is the only acid that acts upon the cotton wool, the sulphuric merely increases the rapidity of its action.

---

* Hardwich's Photographic Chemistry.

Pyroxyline can be made from many varieties of cellulose. Cotton, straw, pith, flax, linen, calico, have all been used, giving more or less different results However, cotton wool is the substance generally employed, and sea islands cotton is generally preferred. Schering's celloidin is a very pure variety of coliodion cotton. It occurs in horny faintly yellow masses, soluble in alcohol and ether and giving a very fine collodion, producing an even and structureless film.

Pyroxyline is insoluble in water, alcohol or ether alone, but is soluble in a mixture of the two latter, forming collodion.

Hardwich says that the temperature of the nitro-sulphuric acid at the time of immersing the cotton invariably affects the photographic properties of pyroxyline. At high temperatures a portion of the film is converted into a substance which has a bitter taste, and turns brown when treated with alkalies. This substance is believed to be nitro-glucose, formed by the action of strong nitric acid upon grape sugar; the grape sugar itself being prodnced by the cellulose by contact with the warm and diluted sulphuric acid. Its presence in the collodion tends to diminish the sensitiveness of the film to weak rays of light, but increases the rapidity and intensity of the development in negative images.

Pyroxyline is liable to decomposition, a partial liberation of oxides of nitrogen apparently taking place, forming in some cases, red fumes within the bottle. It can be kept perfectly, however, if the following precautions are taken: First, it should be thoroughly washed and thoroughly dried; and, secondly, it should be kept in a well-ventilated vessel—a thin cotton bag, in which it can be loosely stowed away is a good receptacle. It is dangerous to press it too tight in a stoppered bottle. Light, heat and moisture are all agents facilitating decomposition, it should therefore be kept in a dark, dry and cool place.

Papyroxyline.—Liesegang was probably the first to introduce this substance for collodion making. It is a kind of pyroxyline made from paper instead of from cotton wool. The following is a formula for washed emulsion processes :—

Nitric acid sp. g. 1·45	2 fluid ounces.
Sulphuric acid sp. g. 1 845	3 fluid ounces.
White blotting paper*	145 grains.

The temperature should be about 100 degs. Fahrenheit and the time of immersion about half an hour.

QUALITATIVE ANALYSIS.—See **Analysis.**

QUANTITATIVE ANALYSIS.—See **Analysis.**

QUART.—The fourth part of gallon; two pints, or 69·3185 cubic inches.

QUARTER=PLATE.—The size of dry plate, 3¼ x 4¼ inches.

QUICKLIME.—See **Calcium Oxide.**

QUINOL.—The same as **Hodroquinone** (*q.v.*)

QUINOL DEVELOPER.—See **Hydroquinone.**

QUINOLIN, RED (Formula, $C_{26}H_{19}N_2Cl$).—Occurs either in the form of a deep crimson, powder or in reddish-brown prisms It is only slightly soluble in water, but soluble in alcohol, forming a solution having a reddish-yellow fluorescence. It occurs mixed with cyanin blue in commercial azalin, used in orthochromatic work.†

QUINTAL.—A measure in weight according to the metric system. It is equivalent to 220·46 lbs. avoirdupois.

RACK AND PINION.—A contrivance for producing a limited rectilinear motion from a circular one. A tooted wheel or pinion rotating about its own axis is caused to work in a straight or toothed bar. This contrivance is often attached to the focusing arrangement of the camera By simply turning a screw or small handle the distance between the lens and the focusing scene can be adjusted at will.

RACKS.—Contrivances, usually of wood or metal, used for drying or draining plates. Those made to fold up are the most convenient for use.

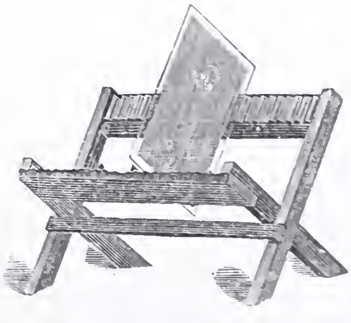


FIG. 383.—DRYING RACK.

RADICAL.—The basis of a compound. Gerhardt's definition is, "the proportion in which certain elements or groups of elements may be substituted for others, or may be transferred from one body to another in the act of double decomposition."

RADICAL COMPOUND.—In organic chemistry a compound radical is a group of elements which, in the various changes and decompositions which a substance undergoes, remains unaffected, and acts as if it were an element. Cyanogen, ethyl, etc., are compound radicals.

---

*Papier Josef or Swedish filtering paper is a pure form that can be used for this purpose.
†C. J. Leaper.

RAIN WATER.—See **Water.**

RAPIDITY.—The rapidity of a lens is dependent upon the relation the focus bears to the working aperture. The rapidity of the photographic dry plate is usually known by its sensitometer number, but this is often very misleading, however. The rapidity is usually obtained by heating the bromide emulsion for some time or by the ammonia process.

RAPID LENS.—Any lens allowing a large quantity of light rays to pass through upon the sensitive plate. The rapidity of a lens is dependent upon the relation the focus bears to the size of working aperture. Depth of focus and definition are opposed to rapidity, and, therefore, any arrangement tending to increase the depth and definition can only be made at the expense of rapidity. It is generally understood that the rapidity of all lenses is equal with the same ratio size diaphragm. Although this system holds good with single lenses, through which the same amount of light is always admitted through the same size aperture of diaphragm, yet with combinations of two lenses, a certain distance apart, as in rapid rectilinear, etc., this cannot be said to be quite correct. Here the ratio of the focus to the actual aperture no longer regulates the rapidity. The available aperture (A) is in this case given by the equation $A = \frac{fa}{f-d}$, f being the the focal length, a the actual aperture of the diaphragm, and d the distance between the center of the diaphragm and the nodal point of emission of the back combination.

RAPID RECTILINEAR.—A rapid lens corrected for aberration, and giving straight lines when photographing buildings or other similar objects.

RASTER PLATE.—See **Line Screen.**

RAY.—A line of light proceeding from a radiant point or a point of reflection. A collection of rays is termed a pencil. An incident ray entering a doubly refracting crystal is resolved into two; termed from their properties an ordinary and an extra-ordinary ray.

The term ray is also applied to one of the component elements of light, as the violet rays of the spectrum, or the luminous actinic or heat rays.

Visual Ray.—In perspective, a straight line drawn through the eye.

REACTION.—A chemical termed applied to the change or effect produced by bringing two or more elements or compounds together, whereby one or more new bodies are formed.

READY-SENSITIZED PAPER.—Albumenized paper can be purchased ready sensitized. It keeps for about four to six months. Although now made of very good quality the results obtained upon it are never so good as upon paper freshly sensitized without the addition of the preservative necessary with commercial sensitized paper. Ready-sensitized paper can be purchased either in sheets or in cut sizes. The sizes of the sheets are as follow: 18 x 22¾, 20½ x 24½, 22 x 36, 26 x 40, 27 x 42. The paper should be carefully protected from light and from moisture. Packets of cut sizes are better kept under heavy pressure. This not only keeps the paper flat, but also forces out the air from between the sheets and retards its discoloring action.

REAGENT.—A term in chemistry applied to any substance employed to bring about a chemical reaction or change in another element or compound, with the view, generally of either detecting its presence or effecting its separation from other substances.

REAL IMAGE.—See **Optics.**

REAM.—A quantity paper of any dimensions containing twenty quires of twenty-four sheets, or 480 sheets in all. It is a common practice to count 500 sheets in a ream, though with prepared papers this is rarely done.

REAUMUR SCALE.— See **Thermometer.**

RECOVERY OF WASTE.—See **Residues.**

RE-CRYSTALLIZE.—To crystallize again or anew.

RECTIFICATION.—The concentration of a volatile substance by distillation, as when spirits of wine is prepared from a dilute solution of alcohol by repeated distillation.

RECTIFIED SPIRIT.—Alcohol, with sixteen per cent. of water. Sp. gr. 0·838; strength, 56 over proof.

RECTIGRAPH.—A name given to a class of corrected lenses.

RECTILINEAR.—A term applied to lenses which have been corrected for aberration as much as possible, so that in photographing architectural subjects the lines appear perfectly straight in the image.

RED CHROMATE OF POTASH.—See **Potassium Dichromate.**

RE-DEVELOPMENT.—A process formerly adopted with wet collodion. It is in reality intensification of the image, and has been recommended for bromide plates and paper. The negative or print, after thorough washing, is bleached in a solution of cupric or mercuric chloride, and then re-developed with ferrous oxalate or hydroquinone. For bromide paper dilute ferrous citrate developer acts well.

RED FOG.—See under **Fog.**

RED LIGHT.—See **Non-actinic Media.**

RED PRINTS.—Red prints may be obtained by the following process :

Citric acid	100 grains.
Ammonium chloride	100 grains.
Gelatine	10 grains.
Water	10 ounces.

Dissolved the citric acid in a small portion of water, and exactly neutralize with sodium carbonate. Float the paper on this bath for one or two minutes, and sensitize upon a fifty-grain nitrate of silver solution. Fix in fresh hypo without toning.

Another process.* In a small quantity of water mix 72 grammes of nitrate of uranium and 20 grammes of nitrate of copper, then neutralize the solution with a little carbonate of soda, and add water to measure one litre. Sized paper is floated for a minute or two on this solution and dried in the dark. Print until image is fairly visible. Develop with an eight per cent. solution of potassium ferricyanide until the required density is obtained. Fix by well washing ; or

Immerse a well fixed and washed bromide print into a 15 per cent. solution chloride of copper. The picture is converted into chloride of silver and apparently disappears entirely. After careful washing all the copper must be removed ; it is then put for a few seconds in a 5 per cent. bath of ferrocyanide of potassium, washed again, and then transferred to a 2 per cent. bath of copper chloride, when the picture will reappear with a blood red color.

This is one of the best methods of making red photographs, but washing thoroughly after every operation is essential.

RED PRUSSIATE OF POTASH.—See **Potassium Ferridcyanide.**

REDUCING.—When a negative has been over-developed, and becomes too dense, it require. a considerable time printing the positive images. In order to save this it can be reduced. It also happens very often that the plate is under-exposed, and in forcing out the details in the shadows the high-lights become too dense. Here reduction is also advisable sometimes. The action of the solution, however, begins on the surface of the film, and works its way through, consequently, unless the solution be made very weak, it will in all probability dissolve away the shadow details before accomplishing the required reduction in the darker parts of the negative.

With ferrous-oxalate developer reduction in density can often be accomplised by immersing the developed negative in the hypo bath without previously washing. If this has not a sufficient effect a mixture of one part of the ferrous oxalate developing solution and one part of the fixing solution acts as a powerful reducer. Clearing solutions usually have a slight reducing action upon the negative. A method often practiced, although by no means advisable, consists in bleaching the image in a saturated solution of mercuric chloride. Usually, however, the change in color from black to white causes too great a diminution in opacity, and, further, the bleached image will usually change when exposed to the light in printing.

There are a number of formulæ for reducing the image by dissolving it partially away Among these may be mentioned the following:

FARMER'S REDUCING SOLUTION.

Sat. sol. potassium ferridcyanide	1 part
Sodium hyposulphite solution (1 in 5)	10 parts

BELITZKI'S REDUCER FOR GELATINE PLATES.

Water	7 ounces
Potassium ferric oxalate	2½ drachms
Crystallized neutral sodium sulphite	2 drachms
Powdered oxalic acid	30 to 45 grains
Sodium hyposulphite	1½ ounce

The solution should be made up with the ingredients added in the same order as written. It is then filtered and kept in well-corked bottles in subdued light, the influence of light being to reduce the ferric salt to ferrous. Ottomar Jarecki has suggested a modification of this reducer. His formula is as follows:

---

*M. Letellier in *Revue Photographique.*

Water	7 fluid ounces
Sol. chloride of iron	2 fluid drachms
Potassium oxalate	3 drachms
Sodium sulphite, cryst	2 drachms
Oxalic acid, about	35 grains
Sodium hyposulphite	1¾ ounces, av.

The solids are powdered and the chemicals are added in the above order, dissolving one before adding the next. The color reactions that take place are an amber color when the iron solution is mixed with the water, an emerald green on adding the neutral oxalate of potassium; a ruby red with the sulphite of soda, and the original green restored on dissolving the oxalic acid; in fact, the oxalic acid is added little by little until this green color appears, and at the same time the smell of sulphurous acid is perceptible. The color remains the same after addition of the hypo. It is desirable to filter finally.

Bartlett's Reducer.

Perchloride of iron	30 grains
Citric acid	60 grains
Water	1 pint

Dichromate Reducer.

Potassium dichromate	20 grains
Hydrochloric acid	10 minims
Water	1 ounce

Eder's Reducer.

solution 1.

Ferric chloride	1 part
Water	8 parts

solution 2.

Potassium oxalate	2 parts
Water	8 parts

Equal parts of each solution are mixed before using, and a small quantity of the mixture added to a strong solution of hypo. The plate is then immersed, or the solution applied locally, and the image rapidly weakens. The chemical action of the reducer is to convert the silver of the image into oxalate of silver, which is immediately dissolved by the sodium hyposulphite.

Local reduction is a term applied to the reduction of certain portions of the negative only. This is done when the film is quite dry by rubbing it with a soft pad moistened with alcohol until the density is reduced as required. The pad is usually composed of a tuft of cotton-wool or a piece of wash-leather, flannel, etc. For sharply-defined outlines, a pointed stick of soft wood is used steeped in alcohol.

The above remarks all apply to the reduction of gelatino-bromide dry plates. Prints upon bromide paper may also be treated in the same manner.

Prints upon albumenized paper which have been over-printed can be reduced by immersion in a solution of cupric chloride, or before toning, by using platinic chloride in place of the gold salt.

Prints on collodion paper can be reduced by immersion in a very strong solution of hyposulphite of soda before placing in the combined toning and fixing baths.

Cyanotype or ferro-prussiate prints can be reduced by immersion in a weak solution of ammonia, and afterwards into a weak solution of hydrochloric acid.

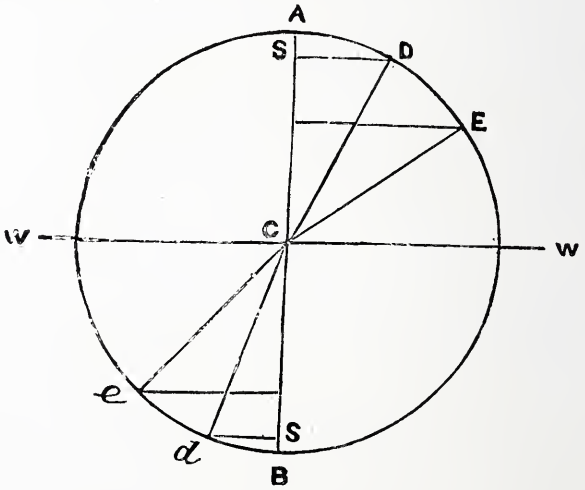


FIG. 384.

REDUCING AGENTS.—In chemistry this term is applied to bodies which have an action the inverse of oxidation, such as nascent hydrogen from sodium amalgam, zinc, etc.

The term is also applied in photography to those agents usually termed developers, which, by their reducing action upon the exposed silver salts, cause the latent image to become visible.

The same term is also given to certain compounds or solutions of compounds which will reduce the opacity of an over-dense negative.

REDUCTION (*in size*).—The operation of producing transparencies or prints from negatives of large dimensions. The opposite to enlarging. The negative to be reduced is inserted in the same position as for enlarging. The lens, however, is turned towards the negative and the image focused on the ground glass screen. The distances will be found on reference to the table of conjugate foci on page 135. In reducing, the greater distance must, of course, be between the lens and the negative, and the lesser between the lens and the sensitive film.

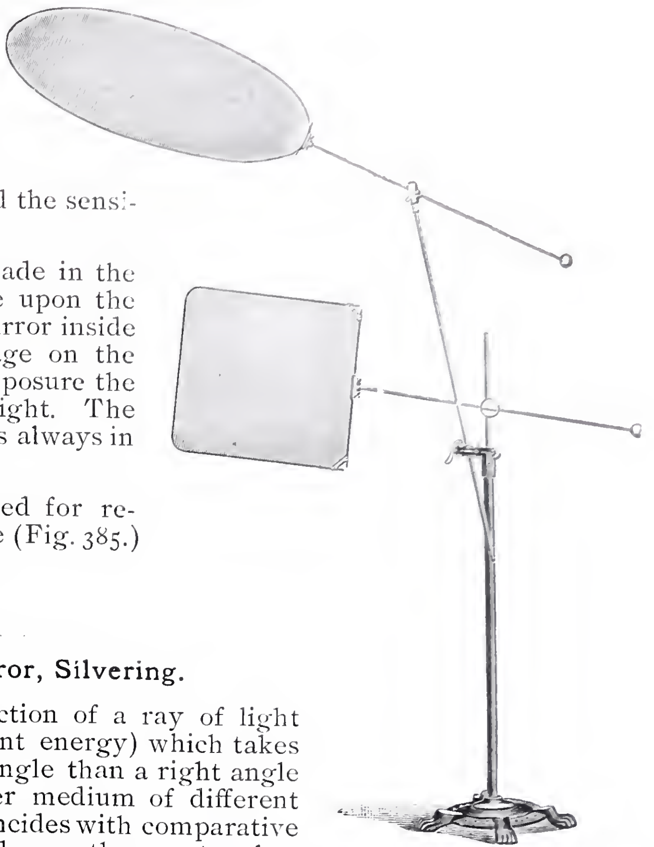
REFLECTING CAMERA.—A camera made in the form of a camera obscura, so that the image upon the ground glass appears the right way up. A mirror inside at an angle with the lens produces an image on the ground glass at the top. When ready for exposure the mirror is lifted up, making the interior light-tight. The dark slide forms the back of the camera, and is always in position ready for use.

REFLECTING SCREEN.—A screen used for reflecting the light upon the sitter in portraiture (Fig. 385.)

REFLECTION.—See under **Optics.**

REFLECTORS.—See under **Optics.**

REFLECTORS, SILVERING.—See **Mirror, Silvering.**



(FIG. 385.)—REFLECTING SCREEN.

REFRACTION.—The bending or deflection of a ray of light (including heat and all other forms of radiant energy) which takes place whenever the ray passes at any other angle than a right angle from the surface of one medium into another medium of different density. This optical density by no means coincides with comparative specific gravity, *e. g.*, turpentine is optically denser than water, but floats on the top of it. It is a retarding influence, and accordingly when the ray enters the denser medium at right angles, though not refracted, it is retarded in a certain proportion, traversing a less distance in a given time. Rays at other angles, it can be shown by analysis, must be bent aside according to a law discovered by Snell, about A.D. 1620. Let W W (fig. 384) represent the refracting surface of the denser medium—for example, water; and draw A B perpendicular to that surface. Describe a circle round the point C where the perpendicular cuts the surface. Now let a ray, D C, enter the surface at C, at some angle A C D with the perpendicular, and suppose it is found by experiment that the refracted ray takes the direction C d. In the first place the refracted ray will be found to be in the same plane as the incident ray. In the second place, if the medium below W W be the denser, the refracted ray will be bent towards the perpendicular, and the reverse in the contrary case, so that a ray, d c incident in water, would be refracted as C D, further away from the perpendicular on emergence into air. But thirdly, the refracted course of every other ray can now be calculated according to the following law. Draw D S and d s normal to the perpendicular, then the lines D S and d s will represent, geometrically, the sines of the arcs A D and d B, and if the radius C A be unity, the numbers expressing S D and d s will be sines of the angles. The sine S D will have a certain ratio to the sine d s. And now if any other incident ray (E C) be taken, its sine found in the same way will be found to bear the same ratio to the sine of the refracted ray. This ratio of the sines is therefore invariable for all incidences for the same homogeneous substance. Such ratio is called its refractive index, and it will be readily seen how the index of any substance, as some kind of optical glass, being once found by simple experiment, the course of every refracted ray incident at any angle on the curved surface can be foreseen, and thus its focus or other properties calculated, or the curves calculated for a given focus, which is simply the point to which refracted rays converge.*

Double Refraction.—Many crystals are not homogeneous, but have different properties of elasticity, etc., in different directions. The effect of such a constitution is that, unless a ray of light enters the crystal in some particular directions, it is not merely refracted in the manner described under refraction, but diverted into two rays. In this case the refracted ray or rays are not always in the same plane as the incident ray.

Plane of Refraction is the plane passing through the normal or perpendicular to the refracting surface at the point of incidence and the refracted ray.

REFRACTIVE INDEX or **INDEX OF REFRACTION.**—When a ray of light passes obliquely from a rare to a dense medium it is refracted to a certain extent, varying with the medium employed, as the sine of the angle of incidence always bears an invariable ratio to that of the angle of refraction, for the same ray and the same medium. This ratio is termed the refractive index of that medium.

---

* Hunter's "Encyclopedia."

The following table gives the refractive indices of a few well known substances :—

Gas.	Index of refraction.
Air	1·000294
Oxygen	1·000272
Hydrogen	1·000138

Liquid.	Index of refraction for mean yellow ray.
Linseed oil	1·485
Oil of turpentine	1·457
Alcohol	1·372
Ether	1·358
Water	1·336
Glycerine	1·470

Solid	Index of refraction for mean yellow ray.
Diamond	2.47 2.75
Sulphur	2.115
Flint glass	1.575
Rock crystal	1.547
Canada balsam	1.532
Crown glass	1.525 1.534
Plate glass	1 514
Iceland spar	1.654
Ice	1.315

REFRANGIBILITY.—The property which rays of light possess of being bent out of a straight line when they pass from one medium to another of different density.

RE-GILDING.—Photographic picture frames may be re-gilt after the following method given in "Spon's Workshop Recipes": —Wash the frame well with a sponge and clean water, and when dry give it two coats of water-gold size mixed with some warm thin size from dry hide or parchment. When dry rub over with fine sand-paper, and it is then ready for gilding with the gold leaf. After acouple of days it can be finished with an agate burnisher.

REGISTER.—The register of a camera is the correspondence in position between the focusing screen and the surface of the sensitive plate or film afterwards introduced. This, especially where lenses of large aperture are used, should be very carefully tested. The most effective method of doing this is by focusing a distant object, such as a signboard with sharply defined letters on it, using the full aperture of a rapid lens. A focusing glass should be employed if the operator does not possess good eyesight. The focusing screen is then removed, and each side of the different double plate-holders is brought into position, having a piece of ground glass fitted where the dry plate is usually placed. The two slides are then withdrawn, and the image examined. If perfectly sharp the register is correct. Another method is to expose a plate and examine for sharpness, but this is also a test for chromatic aberration in the lens.

REGISTERING COPYRIGHT.—See **Copyright.**

RELIEF.—A photo relief is an image in which certain portions stand out higher than others. In carbon and Woodburytype prints the image is in relief, although very slightly. The simplest method of making a relief is described under **Woodburytype.** A relief may be obtained on an ordinary fairly thickly-coated gelatine dry plate. Give a rather full exposure, and develop with—

A.—Potassium hydrate stick	180 grains
Sodium sulphite	180 grains
Water	3 ounces
B.—Pyro	48 grains
Water	8 ounces
C.—Potassium bromide	60 grains
Water	1 ounce

Six drachms of B are mixed with two drachms of A, and the plate immersed until all the detail is produced. Ten drops of C are then added, and development continued until sufficient density is obtained. After development, the plate is well washed and immersed in a 10 per cent. solution of chrome-alum, warmed to about 30 to 40 deg. C., gently brushing it while in the solution with a soft brush. By this means a negative in relief can be made.

THE PHOTOGRAPHIC TIMES.

AN ILLUSTRATED MONTHLY MAGAZINE DEVOTED TO THE ART, SCIENCE AND ADVANCEMENT OF PHOTOGRAPHY.

Issued on the fifteenth of each month.

EDITED BY WALTER E. WOODBURY, F. R. P. S.

SUBSCRIPTION RATES.

For one year,	$4 00	Three months' trial,	$1 00
For six months,	2 00	Single copy,	35

On Foreign Subscriptions, $1.00 is added to pay postage.

Remit by Express Money Order, Draft, P. O. Order, or Registered Letter.

Subscriptions to The Photographic Times received by all dealers in photographic materials in this and foreign countries, also by The American News Co. and all its branches.

ADVERTISING RATES WILL BE SENT ON APPLICATION.

Copy for advertisements must be received at office one week in advance of the day of publication. Advertisers receive a copy of the journal free, to certify the correctness of the insertion.

All literary contributions, correspondence, "Queries," etc., should be addressed to The Editor; all advertising matter to the Publishers.

THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION,
60 and 62 East 11th Street, New York.

Businesses For Sale.

Advertisements will be inserted in this column at the rate of 25 cents per line of ten words. Display lines will be charged double. No Advertisement will be inserted for less than one dollar. Cash must in every case accompany copy, which should reach us not later than the tenth of each month.

STUDIO FOR SALE.—Wealthy N. E. City, unsurpassed location, elevator, steam heat, 12 rooms, all on one floor. Ample room. Cabinets $6 per dozen. 45,000 population to deal with. Sale for high class large work $40 to $75 each. $1,500 cash, and no less. You can more than pay for it first year, present owner going to larger city. B. H., care "Photo Times."

Would like to buy gallery—buy interest—work on shares, or for small salary. Six years experience. Can print, retouch, operate, and make crayons. Samples sent on application. B. W. Taylor, Rocky Mount, Va.

FOR SALE.—Well established photograph studio, business, good will, etc., in a New England town of 25,000 inhabitants. *Patronage first class.* Good reason for selling. Address, for particulars,
WILLIAM RICHARD GRIFFITH,
Real Estate Broker, 265 Main St., Hartford, Ct.

KARL KLAUSER, of Farmington, Conn., wishes to retire from the photographic business, and wants to sell his photographic outfit, consisting of about a dozen valuable lenses (among them a Dallmeyer 8x10 rectilinear, various Morrisons and French lenses), cameras, from 8x10 Anthonys to various stereoscopic and smaller ones, camera stands, wooden backgrounds, etc. Together with his valuable sets of negatives, consisting of about 150 views of the village and of Miss Porter's school buildings, and of a number of yearly school groups. 400 negatives of musical subjects forming the well-known K. Kl. collection sold by Schuberth & Co., Union Square, in New York City. 150 negatives of illustrations to Goethe's Faust, Kaulbach's deluge, etc. 150 negatives of Hendschel's celebrated sketches from life. 150 negatives of copies from Raffael's Madonnas from the best sources, of various works of Michel-Angelo, Titian, etc. The whole of these sets, which are rather underrated, will be sold "*en bloc*," together with the photographic outfit, to the first customer for the sum, in cash, of $500—Five Hundred Dollars.

Employment.

ADVERTISEMENTS OF OPERATORS SEEKING SITUATIONS WILL BE INSERTED FREE OF CHARGE.

Employment Wanted.

LANTERN SLIDES.—I make a specialty of Slides from Diagrams, Prints, etc. for lecture purposes.
H. H. WILLIAMS, Charlottesville, Va.

Wanted—Negatives to retouch for professionals and amateurs. High class work, and at moderate prices. Address Brown, 43 Exchange Place, New York City.

A first-class retoucher and operator, 14 years experience, wants steady position, city or country. Address Albert, 127 Hoyt Street, Brooklyn, N. Y.

Position Wanted—A young man having some experience at making pictures wants position in gallery to learn more about it. Can give good references. Would take interest with good party. Daniel Hannah, Sprankles' Mills, Pa.

A1 DARK ROOM MAN, with 8 years experience at out-door photography in all parts of the globe, wishes position in gallery. J. B. Clarke.

PHOTOGRAPHER—Printer and toner, albumen, aristo, Willis & Clements' platinotype papers; developer of films and plates.
SCHAEFER, 353 Marshall St., Paterson, N. J.

First-class operator, retoucher and printer, 18 years' experience, best of references. Address "O. M," 32 37th Street, Brooklyn, N. Y.

A fine retoucher who can do crayon, free hand, or on print. Operator, willing to do all branches, wants position, or would run gallery on shares. J. Dunlop, Gloversville, New York.

Wanted, position by a first-class, all-round man, capable to take charge of studio; competent in all branches. Best references as to ability and character. Address L. Winter, 1994 Third Avenue, N. Y. City.

Artist and retoucher wants situation. Special portrait designs, water colors, etc. E. Urban, 323 East 90 Street, New York.

Note.—Some interesting reading matter will be found on the following pages.

IN ADDITION TO
French Satin Jr.
THE STANDARD BLUE PRINT PAPER

We are Manufacturing a line of

Photographic Specialties

The same careful supervision which controls the manufacture of our Blue Print Paper will be extended to these new products, of which we have ready

MILLEN'S

- NORMAL PHOTOGRAPHIC DEVELOPER
- CHROMIUM FIXING SALT
- STANDARD WHITE PASTE
- HARDENING SOLUTION
- HYDROQUINONE (*Chemically Pure*)

Send for descriptive circulars of any of the above articles

J. C. MILLEN, M. D.,
Manufacturing Chemist,
DENVER, COLORADO: *No. 1731*
Welton Street. .·. .·. U. S. A.

FOR SALE.—Three Photo Gelatine Power Presses (Faber-Schleicher), formerly belonging to the F. Gutekunst Co. Will be set up in running order and instruction given. The Albertype Co., 15 Laight Street, New York.

H. B. PUTERBAUGH, PHOTOGRAPHER AND PROCESS ENGRAVER.

JOHN CARBUTT, Esq., Wayne Junction, Pa.

Dear Sir: Sample of your "New Process Plate" at hand and tested with the MOST PLEASING RESULTS. I send herewith a small order for Strippers, and if I have as good success as I had with my first trial, I shall discard the wet plate process FOREVER, for I am disgusted with it. Very respectfully,

(Signed) H. B. PUTERBAUGH.

RETOUCHING FOR THE TRADE—First class work at moderate prices. Address Miss ALICE WINSLOW, 1,129 N. Main street, Brockton, Mass.

LANTERN SLIDES.—If you require good ones from your negatives send to

H. H. WILLIAMS, Simeon, Va.

MORAN'S BARGAIN LIST No. 47,
NOW READY.

If you want anything in the Photographic line, it will pay you to send for it.

FREE USE OF DARK ROOM.

R. H. MORAN, 22 East 16th St., New York.
One Door West of Union Square.

SPECIAL NOTICE.

BACKGROUNDS
FOR CARBON AND
PLATINUM EFFECTS.

W. F. ASHE, Scenic Artist,
76 East 9th Street, - - New York City.

JOHN BRADLEY,
...MANUFACTURING CHEMIST...
SOLE MAKER
OF
PROFESSIONAL PLATINUM ...PAPER...

THE PAPER ON WHICH MASTERPIECES ARE MADE,
Representing the highest standard of Photographic Art.

Developer, Small Size, - .15
" Large " - .35

Mailed free on Receipt of Price.

Special Price per Gross on Application.
Price List of Printing for the asking

SIZE.	J. Smooth Per Doz.	B. Rough Per Doz.
3¼ x 4¼	$ .25	$ .25
4 x 5	.35	.40
4¼ x 6½	.50	.55
5 x 7	.55	.65
5 x 8	.70	.80
6½ x 8½	.95	1.10
8 x 10	1.45	1.60
10 x 12	2.20	2 50
11 x 14	3 00	3.45
14 x 17	4.75	5.50
16 x 20	0.60	6.25
20 x 26	8.00	9.00

J. BRADLEY, { THE ARTISTS ASSOCIATION, 47 N. Thirteenth St., Phila., Pa.

THE ALBERTYPE COMPANY
PHOTO-GELATINE PRINTERS
15 LAIGHT ST., NEW YORK.

VIEWS MADE INTO **SOUVENIRS**

at short notice, from photographs or negatives.

SEND FOR SAMPLES AND EDITION PRICES.

BARGAINS IN LENSES.

Some of these Lenses are new. All are in perfect condition.

	List Price.	Sell For.
1 8 x 10 Ross Rapid Symmetrical Lens, Waterhouse D.	$55.25	$33
1 15 in. Ross Portable Symmetrical, Iris Diaphragm,	65.75	40
1 12 in. Ross Portable Symmetrical, Iris Diaphragm,	59.50	35
1 8 in. Ross Portable Symmetrical, Iris Diaphragm,	38.00	23
1 6 in. Wray Wide Angle Rectilinear, Rotary Diaphragm,	24.00	15
1 4⅝ in. Wray Wide Angle Rectilinear, Rotary Diaphragm,	22.00	12
1 12 in. Wray Single Landscape, 8 x 10,	36.00	17
1 Prosch Shutter fitted to same,	12.00	3

Any of these Lenses will be sent by express on receipt of price, subject to one week's trial. If returned, express charges prepaid, in good condition, money will be refunded Address

HENRY G. PEABODY,
338 Washington Street, Boston, Mass.

Use "Non-Cockle" Mounting Paste.

The Permanency of R. M. & W. Products is Beyond Question.

The Only Matte Paper for Winter Printing,

VERA MATTE

Pure Collodion.

Does not Freeze under the Negative.

ASK YOUR DEALER FOR IT.

. . . MADE BY . . .

Reichenbach, Morey & Will Co.,

Rochester, N. Y.

Makers of Vera, Vera Matte, Victor, Victor Matte, and Victor Special.

Order Your Photo Goods

OF THE

NEW STOCK HOUSE

Meyer Brothers Drug Co.

Saint Louis.

New Things Photographic

all come to our store. Some sell slowly, others quickly, but visitors can here see everything old and new and buy at lowest market prices for cash.

The Scovill & Adams Co. of New York

Nos. 60 and 62 East 11th St.
(Five doors from B'way)

Send 35 cents for a sample number of The Photographic Times, containing about 100 handsome photographic illustrations.

"SUNLIGHT AND SHADOW" is a book that will delight the heart of photographers whether amateur or professional. It is a handsome volume, edited by W. I. Lincoln Adams, and illustrated by original photographs from nature. Mr. Adams is an authority on the subject of photography, and is the author of several text books that have been widely studied.***

"The illustrations are exquisite and the author's work is testimony enough that he is an adept in his chosen art."—*Chicago Post.*

"SUNLIGHT AND SHADOW," according to the *Photographic Recorder* of October, is the greatest photographic publication that has appeared this year in the interest of the practical photographer, both professional and amateur.*** It covers the entire field of photography in a manner so thoroughly practical that each lesson in itself is worth to an every-day worker what it costs.

"The well-known photographic writers and artists that have contributed to its pages are easily recognized as leaders of the profession, and every photographer should have a copy of this work on hand for reference."

KING OF
FLASH LIGHT POWDERS.
LUXO
PATENTED.
FOR SALE BY ALL DEALERS
W. P. BUCHANAN. PHILADELPHIA.

THE NEW GILSON ADJUSTABLE ALBUM,

With Adjustable Covers and Interchangeable Leaves,

Is specially made for **Amateur Photographers and Photograph Collectors.**

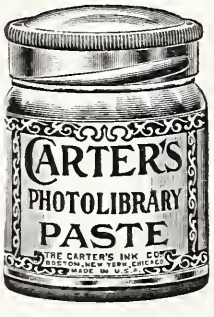
It is the **only album** that fits collections of all sizes, employing **from 1 to 48 leaves,** which may be added or taken out without disturbing others by simply loosening a silk cord.

It is equally valuable for small or large collections, and is made in all styles and sizes of leaves and bindings.

Prices for Albums complete, 80c. to $5 00

For sale by Dealers generally. Send for Descriptive Catalogue **S.**

Mount your Photographs with



CARTER'S
Photolibrary Paste,

A strong adhesive, quick in action and always ready for use.

Whiteness is a sign of purity. Beware of imitations which betray their impurities by their dingy color.

Carter's is pure white, bespeaking its chemical purity. If your dealer cannos supply you, a 14 oz. Jar will be sent, express prepaid, upon receipt of 25c.

THE CARTER'S INK CO.

BOSTON
NEW YORK,
CHICAGO
LONDON,
BRUSSELS

Reifschneider's Eclipse Albums are the Best.

DID YOU GET OUR
BARGAIN
LIST = = = No. 9

32 Pages of
LENSES,
CAMERAS,
BURNISHERS,
STANDS,
BACKGROUNDS,
Etc., Etc.

We buy and sell Photographic Apparatus.

Was mailed October 15, 1897.

RALPH J. GOLSEN,
146 State St., CHICAGO.

Apparatus for making : : : :

FILMS

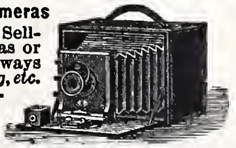
Or PICTURE RIBBONS, for moving-picture machines.

Perforators, Standard Gauge,	$100
Cameras, Hand, Spring, and Electric,	$75 and $150
Printers, Gas and Electric,	$25
Developing Trays,	$25 and $100
Complete plant,	$150

LIBERAL DISCOUNT TO TRADE.

C. FRANCIS JENKINS, 1325 F Street, N. W., Washington, D.C.

N. Y. CAMERA EXCHANGE
50% Saved on all makes of Cameras
Headquarters for Buying, Selling, and Exchanging Cameras or Lenses. Large assortment always on hand. *Developing, printing, etc.*
Photo supplies of every description at *lowest prices.*
☞ *Send 2c. stamp for bargain list.* Address
N. Y. CAMERA EXCHANGE, 41 Fulton St., NEW YORK.



Albumen Paper
W. HEUERMANN,
23 CEDAR STREET, NEW YORK.

Cameras

The Gameland Publishing Company, Incorporated, 63 Rutgers Slip New York, N. Y., will give a large number of cameras to those persons who send to them lists containing the greatest number of words formed from the letters in the word "CAMERAS". The prizes range from $75 Folding Kodaks to pocket cameras. All competitors must send $1 with their lists for one year's subscription to GAMELAND. Contest closes February 15th, 1898. Sample copy of GAMELAND, containing full particulars of contest, Free.

ALUMINUM
SUN FLASH POWDER
(PATENTED)
WILLIAMS, BROWN & EARLE
PHOTOGRAPHIC SPECIALTIES
PHILADELPHIA
FOR SALE BY ALL DEALERS

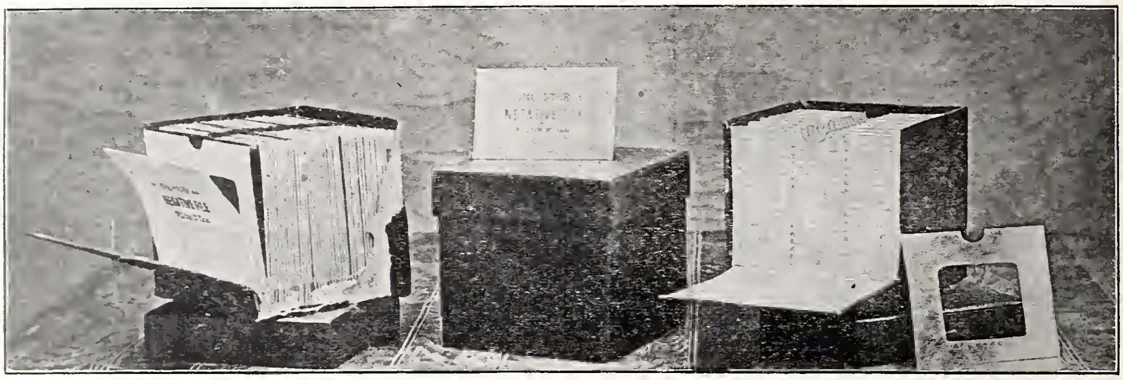
ASK TO SEE THE NEW
W. B. & E. ART ALBUMS
NO PASTING REQUIRED
W B E
WILLIAMS, BROWN & EARLE
PHOTOGRAPHIC SPECIALTIES
PHILADELPHIA
SOLD BY ALL DEALERS

Always Ready.—A SINGLE Developer that never fails, energetic. Keeps indefinitely. Can be used over and over again until exhausted ; don't stain fingers, brilliant negatives, never appeared in print, great money saver. Cheaper by half than Pyro. Formulae mailed to anyone for $1.00. Address, Evans, No. 9 West Main St., Middletown, N. Y.

Cameras and Cash
We've got the Cameras and want the cash. Photo supplies of all sorts and of all makers
Complete Photographic Library (56 instruction books covering the entire field of photography.) New Store—convenient. :: :: :: :: :: ::
Prices that render the goods Prizes
The Scovill & Adams Co. of New York
Nos. 60 and 62 East 11th St.
(Five doors from B'way)
Send 35 cents for a sample number of The Photographic Times containing about 100 handsome photographic illustrations.

Are You Using Hammer Plates?

PRESERVE YOUR NEGATIVES.



THE STAR NEGATIVE FILE

is of great convenience to the photographer. It holds 50 negatives (or Lantern Slides), between pasteboard mats which can be numbered for quick reference. It is also furnished with an index, with numbers corresponding to the numbers on the mats. They are made in three sizes.

Price for Lantern Slide size, 50 cents.

4 x 5 size, 60 cents. ∴∴ *5 x 7 size, 85 cents.*

For sale by all the trade, and

THE SCOVILL & ADAMS COMPANY OF NEW YORK,
TRADE AGENTS,
60 & 62 EAST ELEVENTH ST., NEW YORK CITY.

Diploma and Medal Awarded at the World's Columbian Exposition, 1893.

THE ALBERTYPE COMPANY,

15 LAIGHT STREET, NEW YORK,
Near Canal Street, West.

Photogelatine Printing.

THE LARGEST PLANT IN AMERICA.

Specialty: Souvenir Albums, Booklets, Catalogues,
Made to Order from Photographs or Negatives.

(WRITE FOR SAMPLES AND EDITION PRICES.)

The Brilliant Developer.

This new developer surpasses all others in **covering power** and **cheapness**, it keeps for weeks after use, and a surprising number of plates can be developed in the same solution before it is exhausted. With equal exposures and equal time of development it will give as an average **three times** more **covering** than any other developer. It is a liquid developer and ready for use after being mixed with an equal quantity of a 10 per cent. solution of Carbonate of Potash. It is very clean and discolors very little even when kept some time after use.

After extensive tests, comparing it with Pyro, Ferro Oxalate, Hydrochinone, Metol Eikonogen, Amidol, etc., etc., it has been ascertained, that in using the Brilliant Developer as an average only **one third** of the time of **exposure** is necessary, compared with the exposure required when developing with the other developers, which is an enormous advantage, especially during dull weather. Thus much money, time, and work can be saved on plates, which otherwise would have been **lost** by **under exposure** or the object having **moved.**

The price is very moderate and lower than of the most developers at present in use, as the same solution can be used over and over again by adding from time to time some fresh Brilliant Developer.

The success this new developer is having in Europe is simply marvellous, especially with professional Photographers, who are as a rule, so reluctant to try new materials. It has obtained a prize at the **Berlin Exhibition for Photography,** and scores of testimonials are arriving every week.

FORMULA.

Dissolve 1 oz. of Pure Carbonate of Potash in 10 ozs. of water.
Mix 1 oz. of Brilliant Developer with 1 oz. of the above Potash solution.

If very soft negatives are required the proportion of potash solution may be increased.

FOR DEVELOPMENT OF BROMIDE PAPER,

for which the Brilliant Developer is also particularly suitable the following proportions are recommended:

½ oz. of Brilliant Developer.
½ " " Potash Solution.
1 " " Water.

This will develop a great number of Prints. For softer results more water must be added.

THE BARMEN DRY PLATES MFY.

TRADE AGENTS:
THE SCOVILL & ADAMS CO.
OF NEW YORK,
60 and 62 East Eleventh Street, NEW YORK.

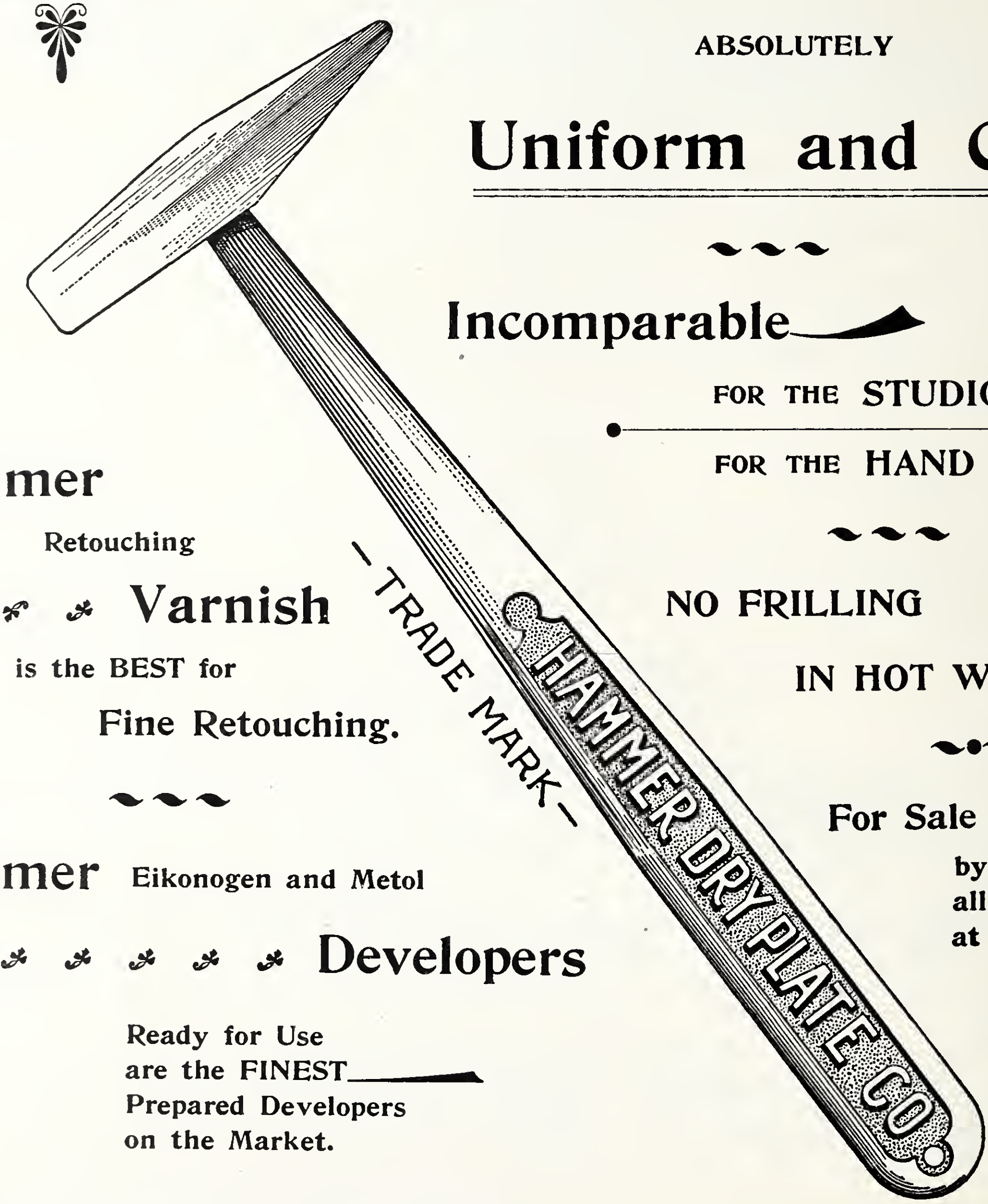
BRUNE & HÖFINGHOFF,
Barmen, Germany.

Use the **Hammer** = =

Dry Plates

ABSOLUTELY

Uniform and Clean.


—TRADE MARK—
HAMMER DRY PLATE CO.

Incomparable

FOR THE STUDIO,

FOR THE HAND CAMERA.

NO FRILLING
IN HOT WEATHER.

For Sale ....
by
all Dealers
at
Popular
Prices.

Hammer
Retouching
Varnish
is the BEST for
Fine Retouching.

Hammer Eikonogen and Metol
Developers
Ready for Use
are the FINEST
Prepared Developers
on the Market.

Send for Hammer's "Little Book" a short talk on negative making, mailed free to any address.

MANUFACTURED BY

Hammer Dry Plate Co.,
ST. LOUIS, MO.

THE SCOVILL & ADAMS CO. OF N. Y., EASTERN TRADE AGENTS.

MINOTT M. GOVAN,
DEALER IN PHOTOGRAPHIC SUPPLIES,
No. 5 Clinton Place, New York.
(Three doors from Broadway.)
FULLY ILLUSTRATED Catalogue and Price List mailed on application. Lenses and Outfits a specialty.

DIETZ RUBY LAMP

For Dark-Room Use.

New Construction
Don't Leak Light.
1½x3x6½ ins.
NO SMOKE.

Sold by Dealers.
We send you one, prepaid, for 75 CENTS.
Circular free.

R. E. DIETZ CO., N. Y.

"Modern and Progressive."

Stephen B. Butts.
John F. Adams.

BUTTS & ADAMS,

TRADE B A MARK

Photographic Supplies,

457 and 459 Washington Street,
BUFFALO, N. Y.

Something New!!

P. P. P. ENLARGEMENTS FOR PHOTOGRAPHERS.

SEND FOR PRICE LIST NOW.

Headquarters for Portraits in Crayon, Water Color, India Ink, and Pastel.

STONE BROS., SUCCESSORS TO N. L. STONE & SON,
56, 58, & 60 Market St., Pottsdam, N. Y.

ACETYLENE GAS

FOR DOMESTIC ILLUMINATION

is the latest and best form of lighting. Our

Patented Automatic Generators

make a private gas plant now practicable and economical.

Write to Department "H" for booklets and circulars which tell all about them and their wonderful product.

J. B. COLT & CO.,

MANUFACTURERS OF

Apparatus for the Production and Projection of Light,

STEREOPTICONS,
LANTERN SLIDES, Etc.

115-117 Nassau Street, - - - - - - New York.
189 La Salle Street, - - - - - - - Chicago.
131 Post Street, - - - - - - - San Francisco.
Erie Co. Bank Building, - - - - - Buffalo.

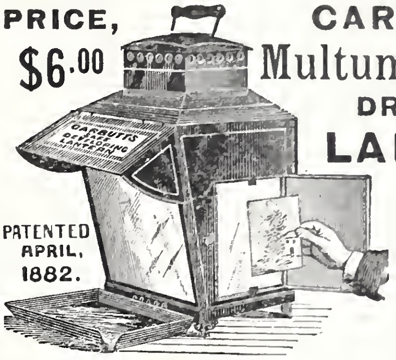
Exhibition Rooms,
New Zealand Building, Broadway & 37th St., N. Y. City.

A Rare Opportunity.

FOR SALE. A well established photo-engraving business: one of the leading houses in New York City. Present owners retiring from business. Responsible parties only need apply, in the first instance, to the Editor of this magazine.

PRICE, $6.00

CARBUTT'S
Multum-in-Parvo
DRY PLATE
LANTERN.



PATENTED APRIL, 1882.

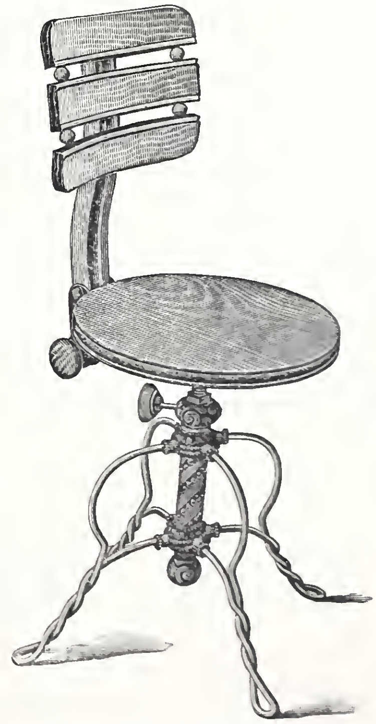
Lantern arranged for developing, and, after fixing, examining negatives and positives by opal light.

The Best and Cheapest for all Dark-Room Work.

Manufactured by
JOHN CARBUTT
Wayne Junction,
Philadelphia.

Photographer's Chair

Indestructible



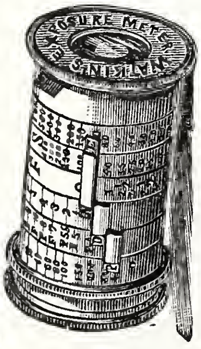
No 2 PRICE, $6.00

IN OAK ONLY, OTHER FINISHES TO ORDER.
STEEL WIRE PEDESTAL, ANTIQUE COPPER FINISH.

The Scovill & Adams Co. of N. Y.
Trade Agents,
60 and 62 East 11th St., New York.

AVOID FAILURES IN MAKING NEGATIVES BY USING THE WATKINS EXPOSURE METERS.

THE NEW STANDARD (1895.) $5.00.



SIMPLER than the old standard, having one less pointer. Provided with the subject and enlarging scales, which do not obtrude themselves when not wanted. The only instrument made which is *absolutely complete* for all problems, especially copying, enlarging and contact printing without reference to tables. It supersedes the old enlarging pattern at a smaller cost. The best all round instrument, as for ordinary work it is quite as simple in use as the Watch or Junior patterns, though not made so light or convenient in shape; quite a feather-weight when made in aluminum. Provided with a pendulum, which is invaluable for timing the actinometer and camera exposures. Exposures under one second are now marked in vulgar fractions, on a distinct part of the scale to the seconds scale.

INSTRUCTIONS (for all ordinary subjects).—*Set pointer P to plate speed, D to the diaphragm, A to the light value, and E will indicate the exposure.*

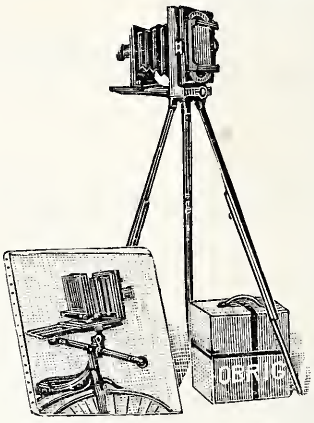
For Sale by THE SCOVILL & ADAMS CO. OF N. Y., 60 & 62 E. 11th St.

P. P. P.

PROFESSIONAL PLATINUM PAPER
(Bradley Process)
A new black permanent low-priced Platinum Paper.
Try it and you will use no other.
SOLD BY ALL DEALERS
WILLIAMS, BROWN & EARLE, SOLE AGENTS
PHILADELPHIA.

OUR FACILITIES

Were NEVER BETTER



For turning out good printing than they are at present. We are known for our good, even and careful work in this respect. With the word **"Printing"** we mean to cover not only **Albumen** and **Aristo** contact work, but **Platinotype** and **Blue Prints** as well. Bromide Enlargements are a specialty with us, and developing both plates and films receive our careful attention and are done at factory prices. Our little **"Booklet of Good Things"** contains prices for all this work, and can be had with our new **Bargain List** (just out) for a one cent stamp.

O. C. Co.'s well known "Special" Blue Paper, 25 cents per yard (cut to any size and mailed free).

OBRIG CAMERA CO.,
165-167 BROADWAY, NEW YORK,
NEAR CORTLANDT STREET.
TELEPHONE No. 4704 CORTLANDT ST.

We have a new KODAK and KODET booklet ready for distribution.

S. P. C. MONOGRAM

On a bottle of chemicals is a guarantee of excellence.

Insist on having the "S. P. C." brand.

For Sale by all the Trade.

STEINBACH & CO., MALMEDY, GERMANY

Manufacturers of

Photographic Papers

For Solar and Bromide Enlargements, Salting, Albumenizing, and Baryta Coating;

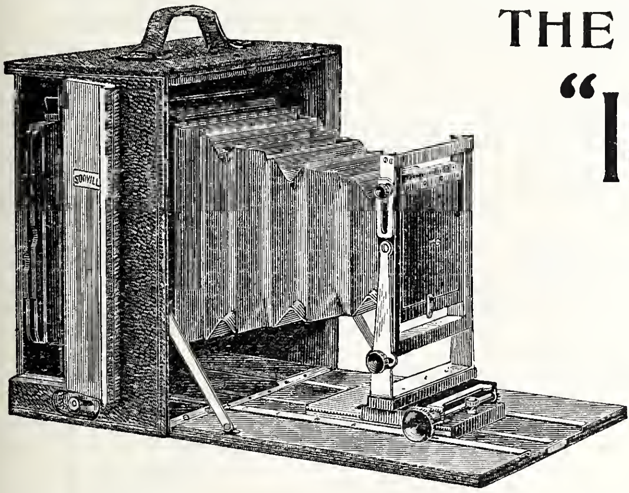
UNEXCELLED FOR BLACK AND BLUE PRINTING,

BARYTA PAPERS, GLOSSY AND MATT SURFACE.

SEND FOR SAMPLES AND ESTIMATES.

NEW YORK OFFICE:
621 BROADWAY.

PAUL PUTTMANN,
Sole Agent for the U. S. and Canada.



THE IMPROVED

"IRVING-CLAY"

CAMERA

THIS "fin de siècle" Camera, as it has been called, marks the highest attainment in camera manufacture *at the end of this century*. It is made at the works of the well-known American Optical Company, which in itself is a guarantee of perfection in durability of construction and fineness of finish.

A preliminary camera of this name was introduced some weeks ago, and the entire stock was quickly sold. The **Improved Irving-Clay** fully justifies its name, as it is a much improved form of the first camera of this class introduced. It contains two double holders instead of one, and the entire construction of the camera has been improved, with many useful and valuable features added.

The Improved Irving-Clay combines the best features of the well-known "Henry Clay" and "Irving" Cameras, as its name indicates, and is the only hand and tripod folding camera with reversible self-adjusting spring back, and other features characteristic of these two cameras. It is made of thin spruce, highly polished, and is therefore extremely light and portable. It is covered with the best grade of leather, and possesses all the movements—swing back, front focus, shifting front and movable front boards—and conveniences which an "up-to-date" camera should have.

PRICE:		
	6½ x 8½, with *two* Double Irving-Clay Plate Holders,	$45.00
	8 x 10, " " " " "	50.00

The Scovill & Adams Company of New York,

60 and 62 EAST 11th STREET, NEW YORK.

MORRISON WIDE-ANGLE VIEW LENSES.

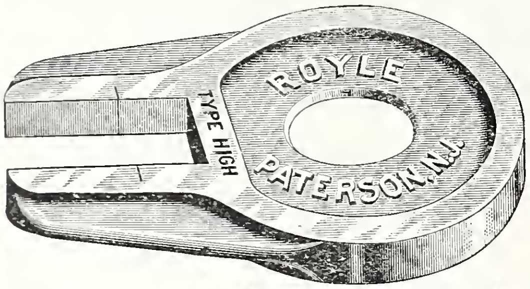
These lenses are absolutely rectilinear; they embrace an angle of 90 degrees, and are the most rapid *wide-angle* lenses made.

No.	Diameter of Lens.	Size of Plate.	Equivalent Focus.		Price.	
0	1 inch	3¼x4¼ inch	2½ inch	each,	$20.00	These 5 sizes will fit into 1 flange.
2	1 "	4 x 5 "	3½ "	"	25.00	
3	1 "	4¼x 6½ "	4½ "	"	25.00	
4	1 "	5 x 8 "	5½ "	"	25.00	
5	1 "	6½x 8½ "	6½ "	"	25.00	
6	1 "	8 x10 "	8 "	"	30.00	
7	1½ "	11x14 "	10½ "	"	40.00	These 2 sizes will fit into 1 flange.
8	1½ "	14x17 "	14 "	"	50.00	

☞ Nos. 1 to 6 are all made in matched pairs for stereoscopic work. The shorter-focused lenses are especially adapted for street and other views in confined situations. For general purposes, a pair of No. 5 lenses will be found most useful.

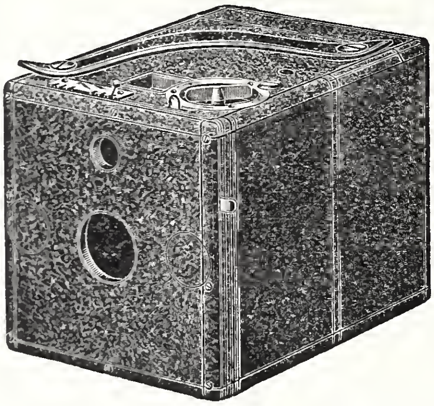
FOR SALE BY ALL DEALERS.

EFFICIENT TOOLS are of the first importance to process-engravers. Our tools are efficient because they are built on correct lines and the workmanship is of the best. We carry a variety of styles and sizes so we are prepared to meet the requirements of all. We have both small and large machines, some cheaper than others, but all good.



JOHN ROYLE & SONS,
Paterson, N. J., U. S. A.

The **Hawk-Eye, Jr.**



for the Professional as well as the Amateur.

Price, $8.

Measures but 4¼ x 4¾ x 6 inches, has a square finder, automatic time register, improved time and instantaneous shutter, with different speeds; loads in broad daylight and can be used with film for 12 or 25 ex. or glass plates.

Send for our catalogue of New Cameras.

THE BLAIR CAMERA CO., **Manufacturers, 22 Randolph Street, Boston.**

THE SPC **ACID FIXING AND HARDENING COMPOUND**

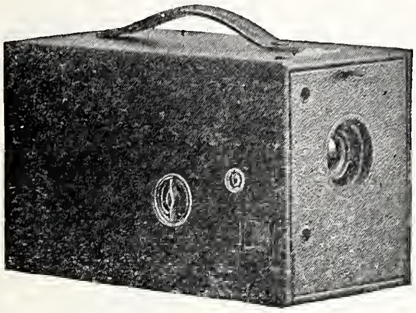
For NEGATIVES, TRANSPARENCIES, LANTERN-SLIDES and BROMIDE PAPER.

Destroys all developing fog and yields peculiarly beautiful and permanent results.

This solution can be used repeatedly so long as it fixes. It can also be used as a reducer of over density by a long continued treatment.

Price, in one lb. packages, only 25 cts. | **In one-half lb. packages, only 15 cts.**

FOR SALE BY ALL DEALERS.



SUNART TRIPODS.

Send 2 cent stamp for Illustrated Catalogue.

All Stock Dealers handle Sunart Cameras.

"SO SIMPLE A CHILD CAN USE THEM."

THE LATEST.

SUNART JUNIOR, 3 1-2 x 3 1-2.

: : : $5.00 : : :

30 Styles, from $5.00 up to $125.00.

Developing and Printing Outfits, Etc.

Sunart Junior, No. 1, 3 1-4 x 4 1-4
The Sunart Magazine Camera : :
Folding and Cycle Cameras : : :

SUNART PHOTO CO.,
23 Aqueduct Street, Rochester, N. Y., U. S. A.

Have You

Secured

Your

GOERZ

ANASTIGMATIC

LENS

Yet?

Be sure

You get

One

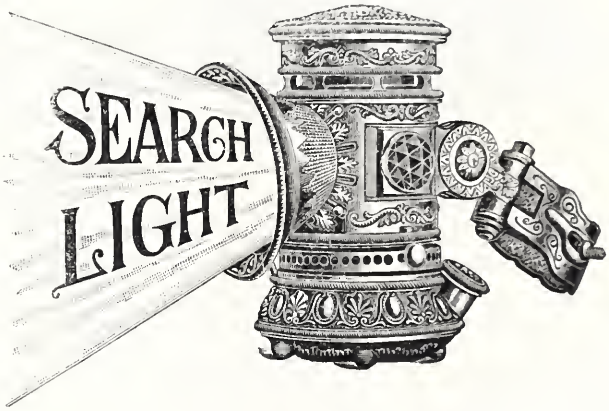
Made by

Goerz.

(Patented.)

ALWAYS

Bright.



Will not jar out
All riders say it is
THE BEST.

THE BRIDGEPORT BRASS CO.,
BRIDGEPORT, CONN.
FOR SALE EVERYWHERE.

THE SCOVILL MAGNESIUM COMPOUND

IS ENTIRELY FREE FROM POISONOUS AND EXPLOSIVE INGREDIENTS.

In order to demonstrate this, quantities have been eaten at various times. It has often been pounded in a mortar to show that it does not explode.

FOR SALE BY ALL DEALERS.

Standard Papers for Photographic Processes.

B. F. K. RIVES

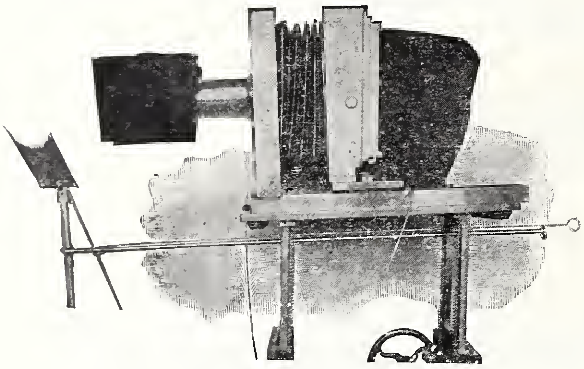
FOR ALBUMENIZING, ARISTOTYPE (GELATINE AND COLLODION), BROMIDE, SOLAR
CHEMICALLY PURE PHOTO BLOTTING PAPER.

NEW YORK OFFICE:
621 Broadway (Cable Building).

BLANCHET FRÈRES & KLÉBER,
RIVES—ISÈRE. (FRANCE.)

The Scovill Vignetter has no Equal.

Acme of Perfection Reached.



PRICE $10.00.

It is worth that much. When you see it, you will agree with us.

It is a nicely nickeled apparatus, perfection of mechanism, an ornament, and decidedly up-to-date, gives your camera an appearance of business.

The only Vignetter worked from back of Camera, having all the movements necessary for making any kind of a Vignette, without the use of **STRINGS OR WIRE,**

It can be used to great advantage in producing rich effects on light draperies, vignette being placed at top of draperies and rapidly lowered during exposure.

It can be adjusted to any stand and placed at any distance from the lens. The color of Vignette can be ascertained upon the ground glass.

For copying purposes it has no equal. Made in either Black Enamel or Nickel Plates. **FOR SALE AT YOUR STOCK DEALER OR**

The Scovill & Adams Co. of N. Y.
60 and 62 East 11th St., New York.

CLEMONS' ARROWROOT Salted PAPER

At last I have succeeded in suspending Arrowroot in solution by combining it chemically with another substance as a filler, that each sheet as it comes from the solution, carries with it an even heavy coating of the combined substance, that cannot be obtained by the old mode of applying of Matt surfacing, which I now have discarded, and each sheet will be stamped with a steel stamp . . . . .

"Clemons' Arrowroot Paper."

This paper gives much better Blacks and whites than any other make of paper put on the market.

I have discarded altogether the make of matt salted surface paper. A single trial will convince any one that it will make much the best prints of any plain paper made.

Made by

JOHN R. CLEMONS,

For Sale By
THE SCOVILL & ADAMS CO. OF N. Y.
60 and 62 East 11th Street.

Sample Sheets, 12 cents by mail.

Finest Quality and Absolute Uniformity are the marked features of

"PERFECTO" PAPER.

We do not believe in blow or bluster, neither do we claim that we have the only paper in the market. We do say, however, that if "PERFECTO" has an enemy in the world, we have yet to learn it. **What other paper firm can say this?**

"PERFECTO" PAPER SELLS ON ITS MERITS.

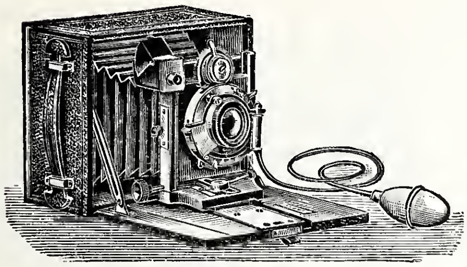
THE "PERFECTO" ARISTOTYPE PAPER COMPANY
79 CORTLANDT STREET, NEW YORK.

Gundlach Optical Co.

ROCHESTER, N. Y.,

MANUFACTURERS OF

Photographic Apparatus....



The only concern in the United States turning out a complete camera, lens, and shutter, all of their own manufacture . . . . . .

OUR LENSES ARE WORLD RENOWNED.

....OUR SHUTTERS LEAD....

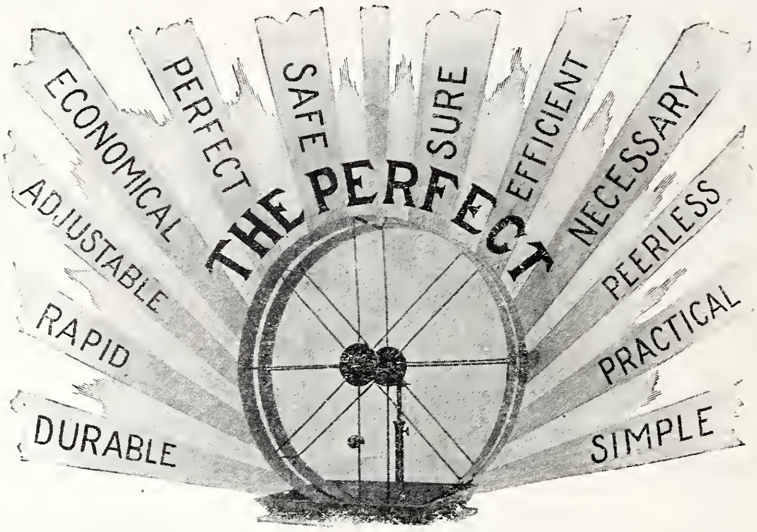
OUR CAMERAS ARE UNSURPASSED IN WORKMANSHIP OR FINISH.

Send for Catalogue.

Gundlach Optical Company,

753 to 765 SOUTH CLINTON STREET,

Rochester, N. Y.



PATENT PENDING.

DEVELOP YOUR OWN FILMS.

The "Perfect" Rotary Film Developer.

This is an entirely new and simple device for developing, fixing and washing films. Among its many advantages are:

GREAT TIME AND LABOR SAVING.

With a "Perfect" you can develop, fix and wash a film in less than one-third the time formerly consumed, and with no more labor than just simply turning the wheel.

EASE OF MANIPULATION.

The "Perfect" is the simplest possible device, and so easy of manipulation that a child might develop, fix and wash any film, a piece of work that formerly required skilful manipulation and great labor. With it the danger of scratching the face of the film in handling is entirely removed.

ADAPTABILITY.

The "Perfect" is adapted to take the film of the Pocket Kodak, Bullet, Bull's-Eye, Hawk-Eye, Baby Hawk-Eye, Presto, Kombi and various other cameras.

WATCHING THE DEVELOPMENT.

The "Perfect" is provided with a division in the surface of the wheel, so that a constant examination of the development is permitted during the process of developing, fixing and washing by transmitted light.

THROUGHNESS IN WASHING.

The "Perfect" makes the process of washing most thorough, by simply turning the wheel in a tray of, or running water.

DRYING.

With a "Perfect" you can dry your films by turning wheel, thus creating a current of air. If extra haste is required, rotate first in a tray containing alcohol.

ADJUSTABILITY.

The "Perfect" is provided with a set screw so that the wheel can be raised or lowered to any point, permitting the use of a minimum amount of developer. In the removal or changing of trays, the wheel can be raised and the tray removed or changed without danger to the film.

SAFETY.

The "Perfect" is made of brass, heavily coated with Japan, and baked at a very high temperature, thus avoiding all danger of rusting or being attacked by any of the solutions.

ECONOMY.

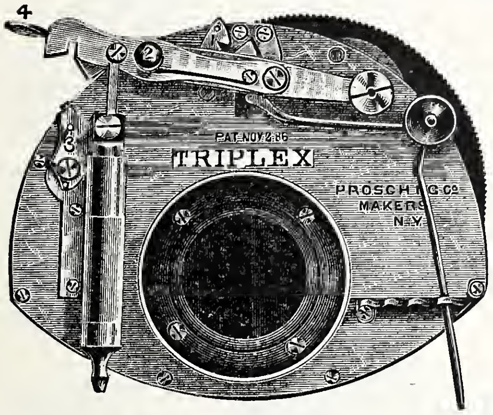
The "Perfect" is the acme of Economy, as films can now be developed rapidly and easily, thus saving the great expense, labor and time formerly consumed. Ladies will find the "Perfect" their Ideal, as a film can be developed, fixed, washed and dried without being touched by the hand.

Price $2.50. For Sale by all Dealers in Photographic Supplies.

THE SCOVILL & ADAMS CO. OF N. Y.

60 and 62 East 11th Street, New York.

THE PROSCH TRIPLEX SHUTTER



Will give you more illumination, better distributed than any other shutter on the market, with about three times the range of speed, and will keep in repair and will always work uniformly. It has "time" movement, "slow-instantaneous and instantaneous to $\frac{1}{150}$ second"

TRIPLEX PRICE LIST.

Aperture in.	¾	⅞	1	1⅛	1¼	1⅜	1½	1¾	2	2¼	2½	3
Price, -	$14	$15	$15.50	$16	$16.50	$17	$18	$18.50	$19	$20	$22	$26

THE ATHLETE SHUTTER, on the same principle as the Triplex, has a maximum speed of $\frac{1}{300}$ second.

SPECIAL ATHLETE, speed to $\frac{1}{600}$ second.

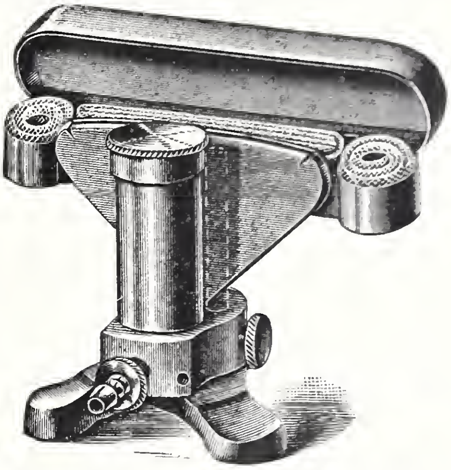
STEREOSCOPIC TRIPLEX.

DETECTIVE TRIPLEX.

PROSCH STORAGE FLASH LAMPS.

LIGHTNING (ORDINARY SIZE,) . . $4 50.
PROFESSIONAL (LARGE SIZE,) . . $9 00.

Are safe, reliable, give more effective illuminating light, with less smell, smoke and dirt than any other flash device on the market.



DUPLEX STEREOPTICON, oxy-hydrogen, of aluminium, with low pressure key and valves, and ¼ size Darlot lenses. **Price, $110.**

UNOPLEX MAGIC LANTERN, with 4-wick Oil Lamp, ¼ size Darlot lens, ... **Price, $50.**

Circulars on Application.

PROSCH MFG. CO.,
389 BROOME ST., NEW YORK.

ACTIEN-GESELLSCHAFT FÜR ANILIN-FABRIKATION
BERLIN
GERMANY
GERMANY
United States of America Patent No. 475372.
Dr. M. Andresen's
EIKONOGEN
16 oz.
The right of utilizing Eikonogen for photography is protected by Patent in all countries. It is conceded to the buyer of that package and expires on the contents having been used
GESETZLICH GESCHÜTZT

Actien-Gesellschaft für Anilin Fabrikation,
BERLIN.

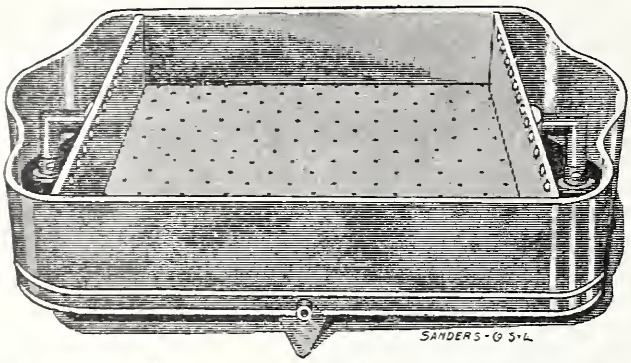
DEVELOPERS:

Eikonogen, Rodinal, Amidol.

Sold by all Dealers.

Ask your Dealer for Formulae and Samples.

THE CALIFORNIA AUTOMATIC PRINT WASHER,



WILL H. LEIGH, Inventor.

The principle on which the Automatic Washer is constructed provides for a constant and complete change of water with an upward and circular motion from being forced through the small holes, and an automatic rocking of the tank gives the entire body of water exactly the same motion that separates the prints in the ordinary tray by rocking. With this apparatus prints never settle to the bottom of the tank, but float in the water and move gently from side to side.

The face of each print is in this way presented to the moving water and imperfect washing is an impossibility.

Prints require no watching nor handling with this washer, thus saving its cost in labor alone.

They are furnished in three sizes, and made and finished for service and wear.

PRICES.

12x12 inches	$ 7.00
20x20 inches	$ 8.50
25x25 inches	$10.00

Leigh's-Combination Photograph-Printing Frame.

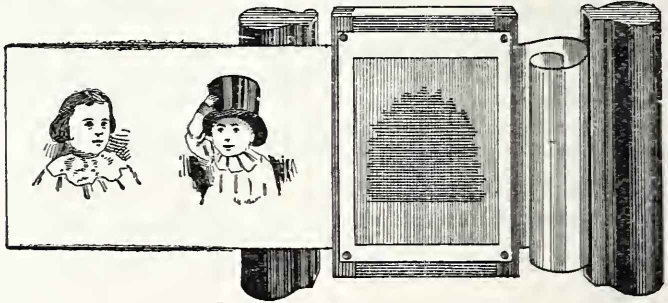
To quote the words of Mr. W. H. Leigh, the inventor, we would say that "The important point we claim for this frame is the doing away with joint lines, and equalizing the space between subjects for combination photographs, **WITHOUT CUTTING DOWN NEGATIVES**, thus often ruining them for future orders for single cabinets, etc.

Prints from ten inches to ten feet in length can be made from as many negatives as desired. The prints can be made side by side, or one above the other Nothing makes better display work, nor attracts the public eye more than the **COMBINATION PHOTOGRAPH**

We furnish two styles of frames, one to open in the regular way, taking paper the narrow way of the frame, and the other with lengthwise opening, taking the paper as shown in the illustration.

PRICES FOR EITHER STYLE COMPLETE

5x7	$2.50 each.	6½x8½	$3.00 each.
5x8	$2.50 each.	8x10	$3.50 each.



FOR SALE BY DEALERS.

H. A. HYATT, Manufacturer, **410 and 412 N. Broadway, St. Louis, Mo.**

JONESBORO, TENN., May 4, 1897.

MESSRS. ALLEN BROS., DETROIT, MICH.

GENTLEMEN:—When I returned the 5 B Suter Lens, keeping the 3 A, I promised to let you know what I thought of the Suter Lens.

Well, I can safely say it is the best lens I ever owned, and, as I wrote you before, I had used fourteen different lenses and some of them were considered the best made, and I thought them pretty good till I tried the ones you sent me, and found so much difference that I am sorry I did not buy a Suter long ago. If I had, would have saved dollars in material, saying nothing about the trouble and disappointments that I have had with them. I have used the 3 A Lens for various kinds of work, in and out of doors, and every time I have gotten good results. For the past two weeks I have been making Views for a Society that is getting up pictures of all the old places of historic note about here, and have not yet failed to get a good picture, and if I had used other lenses I have, I am confident I would have failed on some of them, for some of the views were very difficult objects to photograph.

If there is anything you can get out of this that will be of any use to you, in the way of praise or recommendation to others in regard to the Suter Lens, you are welcome to use it; cut it down and pick out what you want, and if there is anyone you wish to refer to me for testimony, will gladly answer them. I am no optician, but think I know when a lens does the work as it should.

Yours very respectfully,

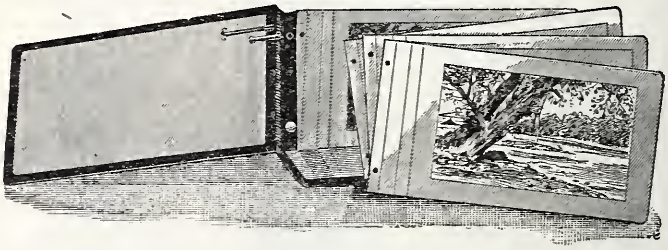
O. L. HENSLEY.

THE REGENT ALBUM.==INTERCHANGEABLE LEAVES.

THE REGENT ALBUM combines neatness with durability.

The patent interchangeable feature is constructed in such a manner as to allow the leaves to be readily removed and replaced with little or no trouble and in the twinkling of a moment.

The leaves of THE REGENT ALBUM lie absolutely flat and are perfectly rigid in the back.



PRICE LIST.

EACH ALBUM CONTAINING 25 LEAVES.

No. 1— 6 x 7	$1 25	Extra Leaves, White or Gray, per doz.,	$0 35
No. 2— 7 x 10	1 50	" " " " " "	45
No. 3—10 x 12	2 00	" " " " " "	75
No. 4 - 11 x 14	2 50	" " " " " "	1 00

LEAVES FOR SQUEEGEE PHOTOGRAPHS.

No. 1— 6 x 7	per doz.,	$0 50
No. 2— 7 x 10	" "	70
No. 3—10 x 12	" "	1 25
No. 4 - 11 x 14	" "	1 55

THE REGENT ALBUMS are bound in full cloth, handsomely embossed, finished with gilt title, and enclosed in a neat box.

THE LEAVES AND COVERS ARE ROUND CORNERED.

THEY ARE MANUFACTURED AND PATENTED BY **FELIX REIFSCHNEIDER.**

FOR SALE BY ALL DEALERS AND THE TRADE AGENTS,

THE SCOVILL & ADAMS CO. OF N. Y., - - - - 60 and 62 East 11th St., New York.

SPECIAL NOTICE.

P. P. P.

PAGET PRIZE PLATES for Lantern Slides.

UNEXCELLED FOR QUALITY AND BRILLIANCY OF TONE.

HIGHLY SPOKEN OF BY THE PRIZE WINNERS.

Read what they say:

New York Camera Club,
Mr. W. C. Cullen : New York, March 30. 1896.

Dear Sir :—In answer to your inquiry, would say, I consider the Paget Lantern Slide Plate as without a rival It is the only plate within my knowledge on which a variety of pleasing tones, running through the blacks, browns, purples and reds, can be produced at will, by *development* alone. Yours truly,

Wm. A. Fraser.

Society of Amateur Photographers of N. Y.,
March 26, 1896.

Mr. W. C. Cullen :

Dear Sir :—The Paget Lantern Slide Plates are superior to anything I have used. The majority of my prize slides were made with them.

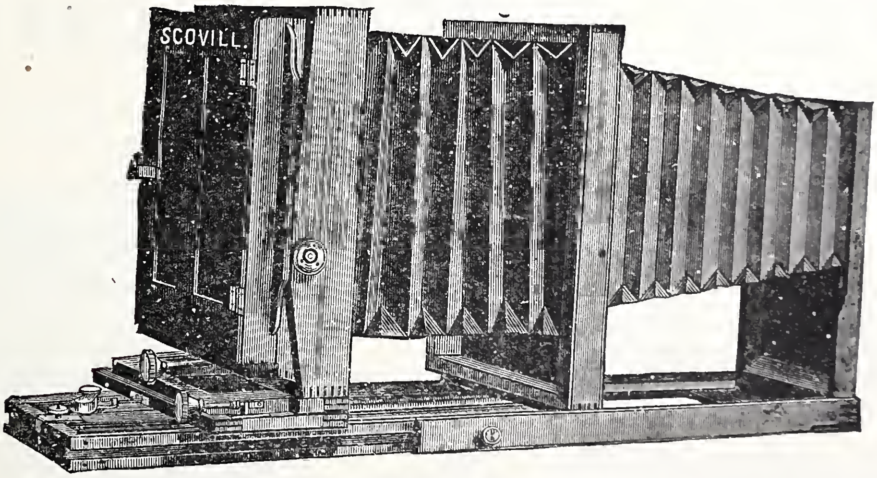
Very truly,

W. B. Post.

W. C. CULLEN, Sole Agent for U. S.,
61 WILLIAM STREET, NEW YORK.

THE SCOVILL & ADAMS COMPANY'S

UNRIVALED PORTRAIT CAMERAS.



The American Optical Company Portrait Cameras are manufactured from the best mahogany, French polished, and have double bellows, vertical shifting front the V-shaped wooden guide, telescopic platform, and Lever Focusing Attachment, by which the most delicate focus can be adjusted with the utmost facility and ease.

No.	Size.		With Double Swing-back.
5	8x10 ins.,	with platform 30 in. long	$3[illegible] 00
6	10x12 "	" " 36 "	48 00
7	11x14 "	extension " 48 " and vertical shifting front.	64 00
8	12x15 "	" " 48 " do	72 00
9	14x17 "	" " 60 " do	76 00
10	16x20 "	" " 65 " do	[illegible]
11	17x20 ins.,	extension platform 65 in. long and vertical shifting front	$[illegible] 00
12	18x22 "	" " 70 " do	100 00
13	20x2[illegible] "	" " 72 " do	110 00
14	22x27 "	" " 72 " do	130 00
15	25x30	" " [illegible]0 " do	[illegible]

(Taken on a Carbutt Orthochromatic Plate,
By Alois Beer, Photographer to Emperor of Austria.)

To obtain Artistic Results,

Carbutt
Non-Halation and
Orthochromatic Plates
Should be Used.
Also J. C. DEVELOPING TABLETS,
Put up in 3 sizes; Price, 25c., 40c., 75c.

STANDARD
FOR
TWENTY
YEARS.

Films Films

EUREKA
RIBBON FILMS

NEGATIVE AND POSITIVE.

For all Makes of
Chronophotographic
Cameras and
Projecting
Machines

SEND FOR CIRCULARS.

FOR SALE BY ALL DEALERS

CARBUTT

SEND FOR CIRCULARS

FILMS

(CUT SIZES)

PLAIN and
ORTHOCHROMATIC

LANTERN
PLATES

UNRIVALLED
FOR MAKING
Lantern Transparencies

SPECIALTIES:

Color Screens
Sizes 2½x2½ and 3½x3½.

Color Screens
For Photochromic Process.
Sets only. Sizes 2½ x 2½ and 3½ x 3½.

Multum-in-Parvo Lantern

Lantern Slide Mats

Lantern Slide Binders

Thin Crystal Cover Glass.

Developers.

PLATES

ECLIPSE
ECLIPSE JUNIOR
Orthochromatic 23 x 27
NON-HALATION
B 16
X-RAY PLATES
Transparency Plates
(Plain or on Ground Glass)
LANTERN PLATES
STRIPPING PLATES
HALF-TONE PROCESS

JOHN CARBUTT, KEYSTONE DRY PLATE AND FILM WORKS, WAYNE JUNCTION, PHILADELPHIA.

"Some Mounting Paste, please" says Inexperienced, and gets what the salesman pleases.

"Some HIGGINS' PHOTO MOUNTER,"

says Experienced, and gets what pleases **him.** The difference is in the articles, and the moral is—if you want a **good thing** ask for it.

HIGGINS' PHOTO MOUNTER is a beautiful, pure, white adhesive, finely scented. A perfect homogeneous solution in a soft, pasty form, from which the water never separates, as in the common starch or flour pastes. Its beautiful, soft, unctuous consistency, and its wonderful smooth and easy spreading qualities (non fluid at rest but fluid under the movements of the brush) are possessed by no other adhesive, and are of the greatest importance in perfect and easy mounting. Does not strike through nor warp, adheres instantly and powerfully, dries quickly and prevents curling off at the edges. Guaranteed never to change or deteriorate. Unequaled for mounting photographs, textile samples, scrap-books, tissue work, and general use as a substitute for mucilage.

REFUSE ALL IMITATIONS.

FOR SALE BY ALL PHOTO SUPPLY HOUSES.

A 3-ounce jar, prepaid by mail, for thirty cents, or descriptive circulars for nothing, from

CHAS. M. HIGGINS & CO., Sole Manufacturers,

London Office, 106 Charing Cross Road. 168-172 Eighth St., Brooklyn, N. Y., U. S. A.

PHOTOGRAPHIC GOODS

OF EVERY DESCRIPTION.

SWEET, WALLACH & CO.

215-221 WABASH AVENUE,

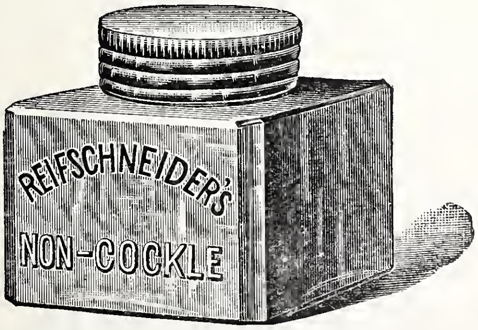
CHICAGO.

Largest and Best Assorted Stock in the World

"NON-COCKLE,"

FOR MOUNTING PRINTS.

GUARANTEED NOT TO COCKLE.



40 Cents per Bottle.

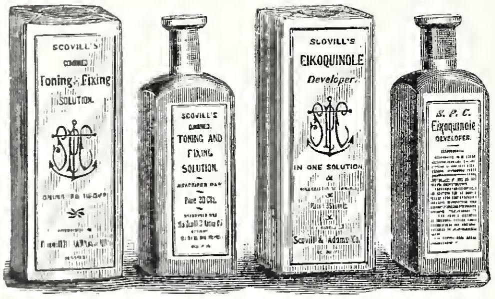
For Sale by all Dealers in Photographic Goods.

THE FAST MAIL LINE.
IRON MOUNTAIN ROUTE
ST·LOUIS TO ARKANSAS, TEXAS MEXICO (THE EGYPT OF THE NEW WORLD) AND CALIFORNIA.
ELEGANT THROUGH SERVICE VIA THIS THE TRUE SOUTHERN ROUTE TO THE WINTER RESORTS OF THE SOUTHWEST
Write General Passenger Agent for Pamphlets giving Particulars.
·ST·LOUIS·

Beware of Cheap Chemicals and Developers.

INSIST ON HAVING THE BRAND

S. P. C.



Your troubles will cease when you use them.

CURRENT LITERATURE *CURRENT LITERATURE* *CURRENT LITERATURE* *CURRENT LITERATURE*

Current Literature

has never been anything but a delightful publication since the appearance of its first number. For the busy people who cannot read all the periodicals, or the family with the limited pocketbook, who can afford only one or two each month, *Current Literature* is an inestimable blessing, selecting and reprinting, as it does, the best things of the month. There is a charm in the very make-up of the magazine which is altogether distinctive."—*Art in Advertising.*

25 cts. a Copy. *$3.00 a Year.*

For Sale on all News Stands.

CURRENT LITERATURE,

Bryant Building, ***New York.***

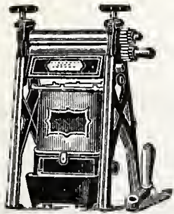
CURRENT LITERATURE *CURRENT LITERATURE*

CURRENT LITERATURE *CURRENT LITERATURE*

CURRENT LITERATURE *CURRENT LITERATURE* *CURRENT LITERATURE* *CURRENT LITERATURE*

WANTED

A good office desk. Must be cheap and in good order send full description or photograph to W. E. W., Editor, The Photographic Times, 60 and 62 East 11th Street, New York.



BURNISHERS

THE MODEL DUPLEX.

6 in., $ 7.50 8 in., $10
10 in., 12.50 12 in., 15

Every amateur should have one. Complete catalogue of Photo Goods, Tripods, Developers, Dry Plates, Cameras, Papers, Etc., free.

JAS. H. SMITH & CO.
311 Wabash Av., Chicago

Dealers supplied at manufacturers' prices.

USE THE

Standard Dry Plate.

They are the best high grade plate on the market, which are sold at the lowest popular prices.

Incomparable for the Studio and Hand Camera, absolutely clean, uniform and rapid.

We manufacture Non-Halation process, transparencies, plain and ground glass, lantern slide and X-ray Plates.

You will make no mistake in ordering the "STANDARD."

STANDARD DRY PLATE CO.,
LEWISTON, MAINE.

THE WATERBURY ALBUM

Is the latest thing on the market in the way of an Interchangeable Leaf Album.

Embossed Black

Cloth Covers,

White Leaves.

NOTE THE LIST PRICE.

7 x 10,	10 x 12,	11 x 14,
$1.10	**$1.60**	**$2.00**

THE SCOVILL & ADAMS CO. OF NEW YORK,

60 and 62 East 11th Street, New York City.

Look out
for
imitations
of

REDUCED
PRICE LIST.

WATERBURY

CARDBOARD.

Look out
for the
genuine, too,
and see
that you
get it.

It is

the Best

and Cheapest.

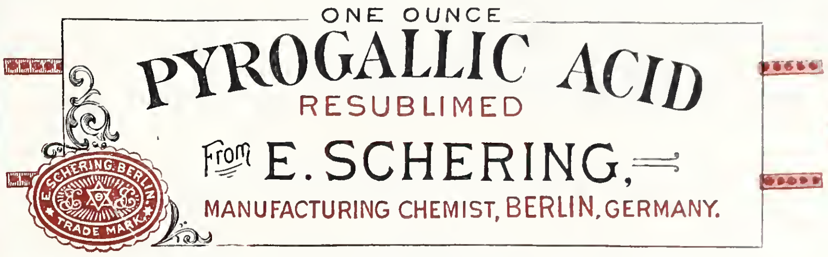
WITH NEW PRICES.
SEND FOR
A SAMPLE

When purchasing a Developer please be particular to specify **Schering's** the oldest and most favorably known brand.

Put up with labels and seals as per fac-similes here given.

E. SCHERING, BERLIN.
TRADE=MARK.

REGISTERED.


ONE OUNCE
PYROGALLIC ACID
RESUBLIMED
From E. SCHERING,
MANUFACTURING CHEMIST, BERLIN, GERMANY.
E. SCHERING, BERLIN.
TRADE MARK

E. SCHERING, BERLIN.
TRADE=MARK.

REGISTERED.

THE STANDARD OF THE LAST—THIRD—EDITION OF THE GERMAN PHARMACOPŒIA.

See that you get the Genuine "Schering's." Excelled by none

Send Orders to your Dealers, or to

THE SCOVILL & ADAMS COMPANY OF NEW YORK.

Remember

THAT

"Three Crown"

Albumen Paper

Is absolutely the BEST.

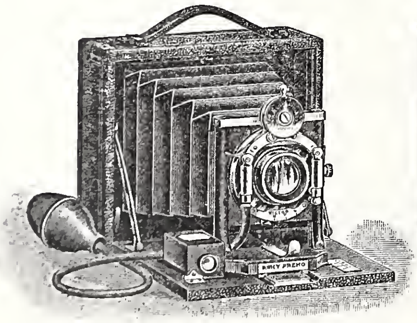
WHY?

Because none but the Best of the Rives Paper is selected for Albumenizing the THREE CROWN BRAND.

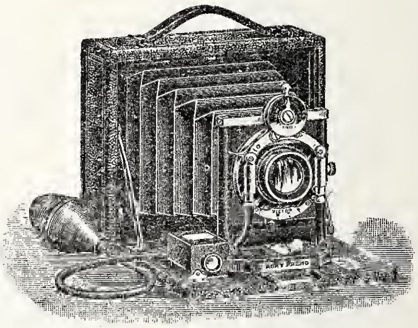
It is therefore free from the imperfections often to be found in other brands, which arise from defects in the plain paper, and hence cannot be avoided.

Premo Cameras **$5.** to **$50.**

Are the standard. If you purchase a Premo, you will know you have the latest and best, and will agree with us that . . . .



PREMOS
PRODUCE
PERFECT
PICTURES.



Send for Illustrated Catalogue.

Rochester Optical Co.
ROCHESTER, N. Y.

Bausch & Lomb
Optical Cos.
ZEISS-ANASTIGMAT LENSES
IRIS DIAPHRAGM SHUTTER
Their perfection equaled only by their popularity.
CATALOG AND TEST CHART FREE
BOOKLET OF BEAUTIFUL CLOUD PICTURES FREE.

524½ N. St. Paul St., Rochester N. Y.

A CAMERA IS A CAMERA.

A POCO is also a Camera,

BUT OF THE HIGHEST GRADE.

It is Manufactured by the

ORIGINAL Rochester Camera Co.,

Which is a guarantee of its superior qualities.

* * *

Cycle Poco,

Folding Poco,

Gem Poco,

ALL PERFECTION AND UP TO DATE.

$5.00 to $100.00. Takes Everything in Sight.

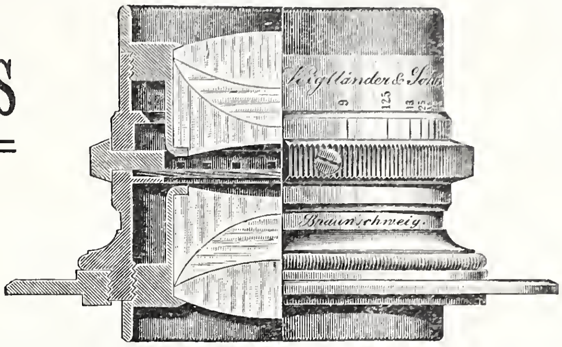
ROCHESTER CAMERA CO,.

Rochester, N. Y., U. S. A.

The Finest Lens yet Produced

: : : IS : : .

Voigtlander's Marvelous COLLINEAR LENS.



· : : THE FAMOUS : : :

Voigtlander Portrait and Euryscope Lenses,

Filling special needs, continue their popularity unabated.

The Genuine . DARLOT LENSES for all kinds of work, also best for STEREOPTICONS are still to the fore.

The above Lense for sale by all Dealers and the Sole American Agents:

BENJ. FRENCH & CO., - - Boston, Mass.

THERE is only one genuine

Platinotype Paper

which gives the art effects that Modern Photography demands —the Willis & Clements paper.

AA, thin smooth; BB, heavy smooth, and CC, heavy rough.

Rembrandt mounts (patented) and Platinotype Paper.

Send for Illustrated Pamphlet.

WILLIS & CLEMENTS,

1624 CHESTNUT STREET, PHILADELPHIA.

The Lundelius Magazine Camera, Patented.

For Professionals and Amateurs.

Small, Light, Complete, Always Ready, and under Positive Control.

NO Doors to Open. Slides to Draw.
Plate Holders. Shutters to Set.
Loose Parts. Obstrusive Fixtures.

But only to

Release the Shutter and turn down the Plate.

Operated entirely from the Outside to Focus, Change Plates, Diaphragm, and Speed of Shutter.

Indicator showing the number of unexposed plates.

Made in *three* standard sizes,
3¼ x 4¼, 4 x 5, and 5 x 7

Fitted with the following Lenses made by Gundlach Optical Co.:

Turner-Reich Anastigmat,
Instantaneous Symmetrical,
and Single Achromatic

All fitted with Iris Diaphragms.

Carries TWELVE Plates or Cut Films.

Catalogue, Testimonials, and Sample Photos on application.

Manufactured by **The Lundelius Camera Co., Incorporated, Port Jervis, N. Y.**

For Night Photography

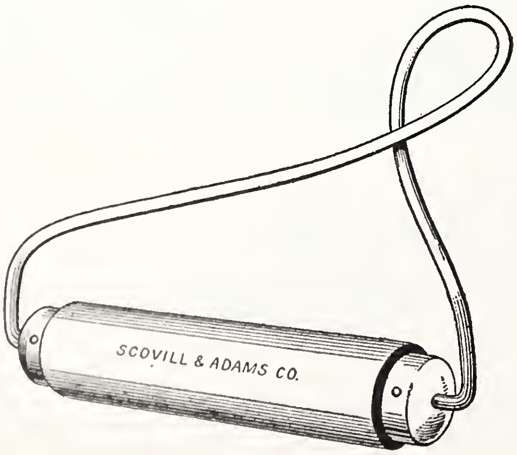
Why?

The Scovill Magnesium Cartridges Are the best

Because they give a more actinic light, produce less smoke, and are safer than any other in the market.

THE SCOVILL & ADAMS CO. OF N. Y.

60 and 62 East 11th Street.


SCOVILL & ADAMS CO.

SOMETHING NEW.

The Simplex Print Roller

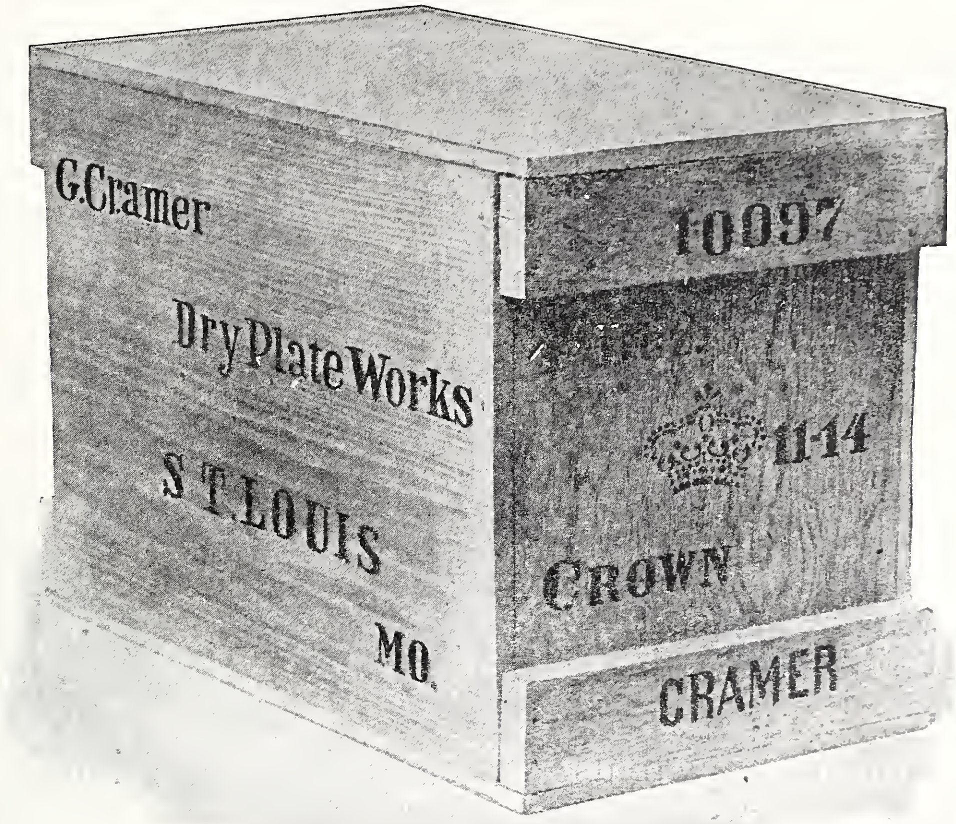
IS SIMPLE AND CHEAP.

ASK YOUR DEALER FOR ONE.

PRICE, 50 CENTS.

FOR SALE BY ALL THE TRADE, AND

THE SCOVILL & ADAMS CO. OF N. Y., Trade Agents.


G.Cramer
Dry Plate Works
ST. LOUIS
MO.
10097
11-14
CROWN
CRAMER

LIFE IS TOO SHORT

to bother with slow, tedious, and difficult printing processes. That's why you should use our Velox papers. They can be used at any time, day or night.

It takes an INCREDIBLY SHORT TIME for turning out LOTS of prints.

No process so Easy and Simple gives such ARTISTIC AND PERMANENT RESULTS.

Sample Packages of two dozen Cabinets, or 4 x 5, two Sample, Prints and Developer, will be sent on receipt of 50 cents.

We manufacture ALL KINDS of Photographic Papers, Gelatine, Collodion, Matt, Glossy, Bromide, etc., and

Our Record has given us an enviable reputation throughout the whole world.

NEPERA CHEMICAL CO.,

Works and Head Office, Nepera Park, N. Y.

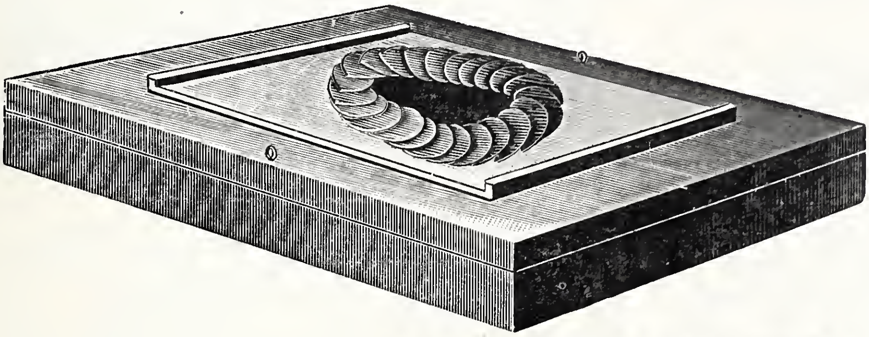
BRANCH OFFICES:

Chicago, Ill., 21 Quincy Street. Paris, France, 159 Faub. Poissonniere.

Order from your dealer, and if he does not fill your order, we WILL.

The Dixie Vignetter

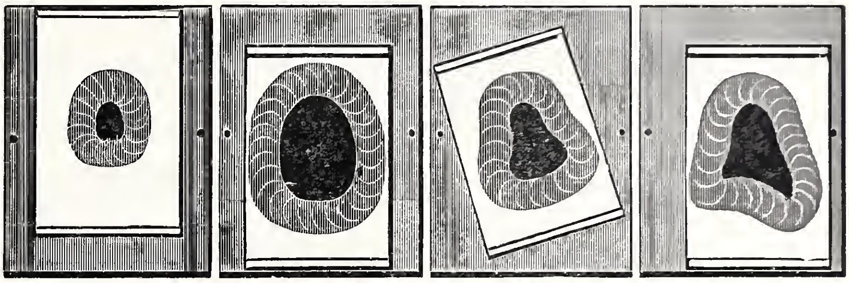
The first and only successful Adjustable Vignetter.



Practical, Cheap, Simple, Durable, and Indispensable to all Photographers who keep up with the times.

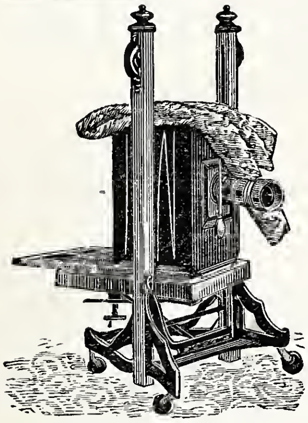
It is attached to the ordinary printing frame, and can be quickly, easily, and accurately adjusted to any negative — the Pear, Oval, Round, Square, or any desired opening can be produced of any size required, and right where it is wanted

The annexed cut shows a few of its many possible adjustments. The Dixie Vignetter is all complete. No separate parts to cost extra and get mislaid and broken, and it is always ready for use. It costs but a trifle and will pay many a dollar in time saved, besides producing superior results.



The Scovill and Adams Company of New York,

60 and 62 East Eleventh Street, New York.



700 Photographers are NOW USING the SEMI-CENTENNIAL CAMERA STAND.

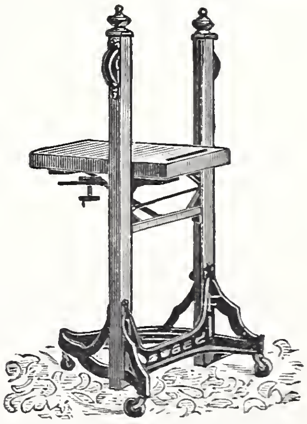
THIS BEATS THE RECORD.

All Dealers sell them.
All Photographers like them.
All should have them.

Send for Price List. The ONLY Stand that gives satisfaction.

HORGAN, ROBEY & CO.

34 Bromfield St., Boston, Mass.



PRINTING-OUT PAPERS

Send twenty cents in Stamps for Sample Package.

MAXIMA PAPER, for Amateurs and Professionals.

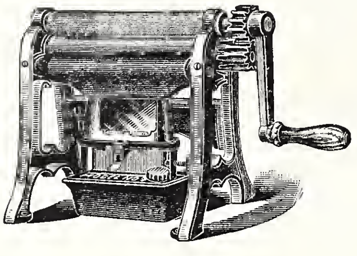
INSOLUBLE FILM.

Invaluable during the winter months owing to its marvellious rapidely in printing. No frilling, on curling, no hardener required. Pure whites. Cabinets, 75 cents per gross. Other sizes in proportion.

United States Aristotype Co.,

Correspondence with Dealers invited. **BLOOMFIELD, N. J.**

JUST OUT — List, $10.00



$8\frac{1}{4}$ IN. Acme Amateur Rotary Burnisher.

FULL NICKEL FINISH. ASK YOUR DEALER FOR SAME.

MANUFACTURED BY

Acme Burnisher Company,

FULTON, N. Y.

METACARBOL CHAVANT.

The most Powerful Developer Known.

Send for Free Sample Package.

VERY HIGHLY RECOMMENDED BY LEADING PHOTOGRAPHERS,

READ WHAT A FEW OF THEM SAY OF IT.

"Having used Metacarbol for a developing agent since its first introduction, with wonderful success, I can most heartily recommend it for its many qualities which are an advantage over all other agents for developing now in use. In the first place it is very uniform; no danger of fog; works equally as well for under or over-timed plate; gives you the finest colored negative possible, which produces a beautiful rich print with all details fully preserved. Being a one-solution developer makes it convenient to work; always ready for action; does not injure your hands or system, nor leave your hands in an unpresentable condition.

"I have never had any trouble with under or over-timed negatives. You will when you come to print find the beautiful effect and all worry and trouble of over or under-timed negatives, which so much destroys the pleasure of the photograph business, will cease."
J. M. Van Norman, Buffalo, N. Y.

"I received the sample of Metacarbol and have given it a trial. I like the results obtained with it very much. Will you quote price on it, and if in my reach will use it?"
A. L. Bowersox, Dayton, O.

"Some weeks ago you sent us a sample of Metacarbol developer. We used it in developing a group that we are almost certain would not come with any other developer that we have ever tried. The white drapery was as fine as we have ever seen. It makes a smooth, brilliant negative."
Knaff & Bro., Knoxville, Tenn.

"Sample of the new developer 'Metacarbol' you kindly sent to me is the best thing in the way of a developer I ever used. I made three negatives on 5 x 7 plates, Bausch & Lomb shutter one-hundredth second, and obtained full-timed negatives. It works well for portraits, making good crisp negatives, of good and quick printing qualities. You deserve the thanks of the fraternity for introducing the ideal developer, and I think you will have large sales of it. Kindly give me the price by the pound."
W. H. Dunwick, Pulaski, N. Y.

"The test of Metacarbol developer was most successful. I found it equal to the best I ever used. Besides it does not stain the fingers"
Geo. W. Ketcham, 25 Cliff St., New York.

"The Metacarbol worked very finely, equal in every way, if not superior to, the developing agents now on the market."
George Steckel, Los Angeles, Cal.

"I have personally given it (Metacarbol) a very fair test, and find that it is a splendid developing agent."
J. Ed. Rösch, St. Louis, Mo.

"The new developer, Metacarbol, pleased me very much. It is exceedingly rapid, and gives fine detail, clear shadows and splendid printing quality. Please send me 3 ounces."
F. M. Somers, Memphis, Tenn.

"We were much pleased with Metacarbol, and find that by its use a much shorter exposure can be made than on a plate of same emulsion that has been developed in the usual way. Add me to your staff of consumers of Metacarbol."
C. M. Hayes & Co., Detroit, Mich.

"Gents:—Send me one ounce of Metacarbol. I think it immense."
G. H. Smyth, Milbridge, Me.

"Your Metacarbol is among the first of the new developers."
Urlin Becker, Cleveland, O.

PRICE.

1-oz. bottle	$ 0.75
2-oz. bottle	1.50
4-oz. bottle	2.75
8-oz. bottle	5.25
16-oz. bottle	10.00

FOR SALE BY ALL DEALERS.

SNAP SHOTS

and all other Photographic Exposures are best developed with

Mitchell's Developing Powders.

They are permanent, portable, convenient and reliable. The developer need only be mixed **when needed**, and is always **fresh** and **strong.**

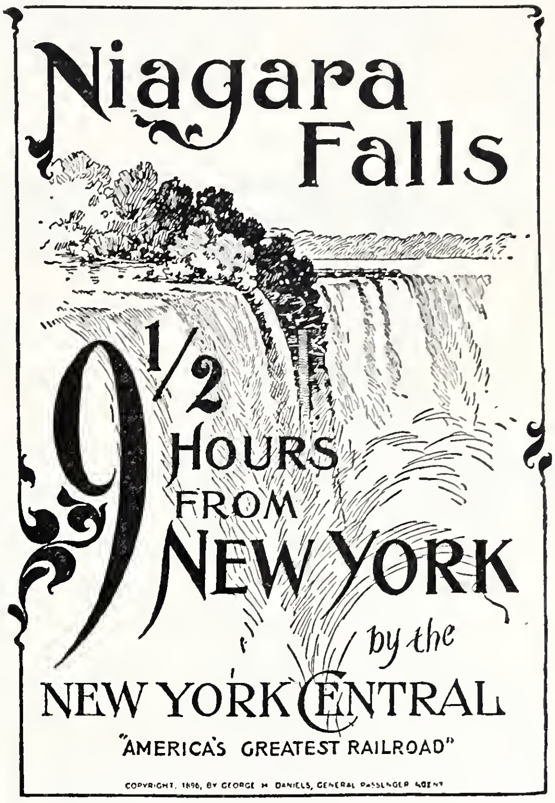
PHAINOGEN	75 cts. per pkg.
EIKO-QUINONE	50 " "
SNAP SHOT	50 " "
BROMIDE PAPER	35 " "
EIKONOGEN	25 " "
HYDROKINONE	25 " "
PYRO	25 " "

CAN BE SENT BY MAIL. POSTAGE 5 CTS. EXTRA.

Ask your local dealer for them. If he does not keep them write to us direct and we will forward promptly by mail on receipt of price and postage. Special descriptive circular **free** on application. Address,

CHARLES L. MITCHELL, M.D.,
1016 CHERRY STREET, PHILADELPHIA.

A full line for sale by the SCOVILL & ADAMS CO.


Niagara Falls
9½ HOURS FROM NEW YORK
by the
NEW YORK CENTRAL
"AMERICA'S GREATEST RAILROAD"
COPYRIGHT, 1896, BY GEORGE H. DANIELS, GENERAL PASSENGER AGENT

The "SIMPLEX"

Printing Frame

Light, Compact,
Simple, Durable
and Inexpensive.

The Frame is made of Japanned Iron, with Wooden Back, covered with Billiard Cloth.

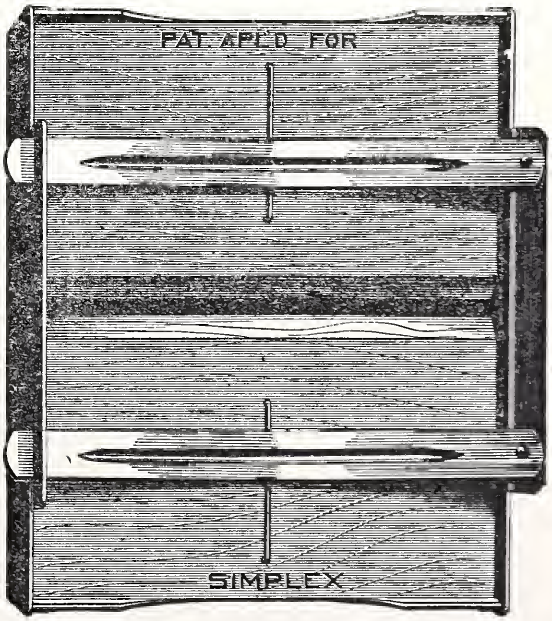
IT SELLS ON SIGHT!

Prices as follows:

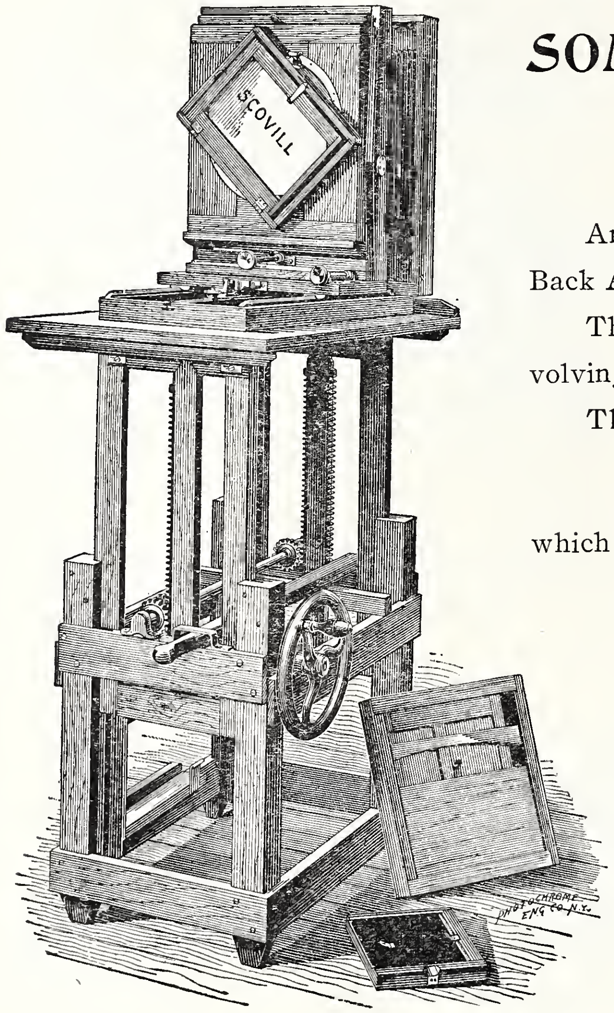
3¼ x 4¼, 3½ x 3½,	24c.
4 x 5,	25c.
5 x 7,	32c.
5 x 8,	35c.

For Sale by all Dealers, and....

The Scovill & Adams Co. of N. Y.,
60 & 62 East 11th Street, NEW YORK.



The Empire Portrait Outfit



SOMETHING NEW

For the Gallery.

An 8 x 10 Portrait Camera, fitted with a Revolving Back Adjuster for 5 x 7 plates.

The position of the plate is changed by simply revolving the turn table of the adjuster.

The outfit comprises also an

Empire Camera Stand

which description we give as follows :

Highest Point from Platform to Floor,	**41 Inches.**
Lowest Point from Platform to Floor,	**26 "**
Width of Platform,	**18 "**
Length of Platform,	**30 "**

THE elevating is done by turning a handled wheel at the side of the stand ; the gearing from this connects with the front and rear platform support, causing the platform to rise or fall according to which way the handle is turned.

All the back of the stand is a lever, which, when pressed to the right, throws the gear wheel in front out of gear, and locks the front platform support. On turning the handled wheel from you, the back of the platform is raised, giving the platform an inclination forward of about 15 degrees. By pressing the lever arm to the left the front gear is again placed in position, and upon turning the handled wheel from you, the platform may be raised without disturbing the dip of the platform. If the handled wheel is turned toward you, the platform will be lowered without disturbing the dip of the platform.

Price of Equipment complete, . . . $45.00.

For Sale by all Dealers, and...

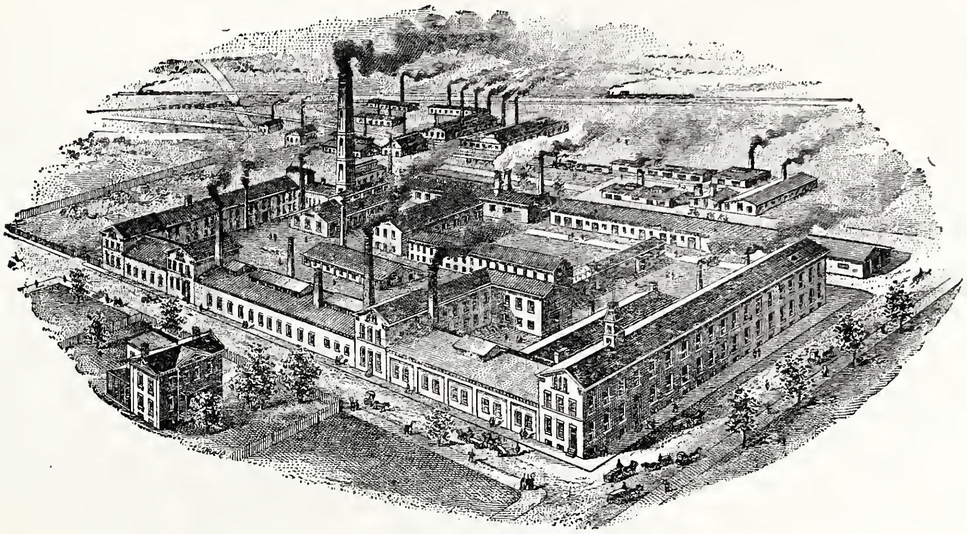
THE SCOVILL & ADAMS CO. OF N. Y.,
60 and 62 East 11th Street, NEW YORK.

CHAS. COOPER & CO.

ESTABLISHED 1857.

Manufacturing Chemists and Importers,

194 WORTH STREET,
NEW YORK.



WORKS AT NEWARK, NEW JERSEY.

Chemically Pure Photo Chemicals.

NITRATE SILVER, CHEMICALLY PURE CHLORIDE GOLD,
SULPHITE SODA CRYSTALS AND GRANULAR. : : : : :
: : LITMUS PAPER, ACID SULPHITE SODA SOLUTION,
COMMERCIAL AND CHEMICALLY PURE ACIDS, ETHERS
AQUA AMMONIA, SOLUBLE COTTON FOR COLLODION PAPER.

**We Manufacture a full line of Chemicals,
Medicinal, and for the Arts and Technical purposes.**

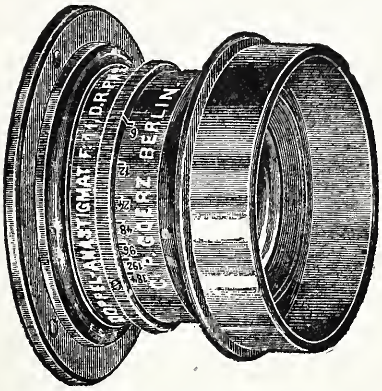
Bromo-Oxygen, a most efficient disinfectant and deodorizer. Can be diluted with 32 parts of water.

MONTHLY PRICE LIST ISSUED.

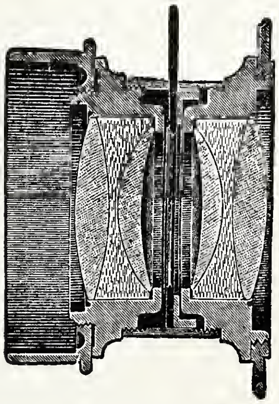
REFINERS OF PHOTO SILVER AND GOLD WASTE.

CARDS FOR MOUNTING PHOTOGRAPHS.

A. M. Collins Manufacturing Co.
No. 527 Arch St. PHILADELPHIA.



German Patent No. 74,437.
American Patent No. 528,155.



TRY THE GOERZ

Double Anastigmat

Before Buying Another Lens.

It will give you better definition, greater depth of focus and more illumination, over the whole of your plate than any other lens on the market.

FOR SALE BY ALL DEALERS OR

C. P. GOERZ,

52 Union Square East, - - - NEW YORK.

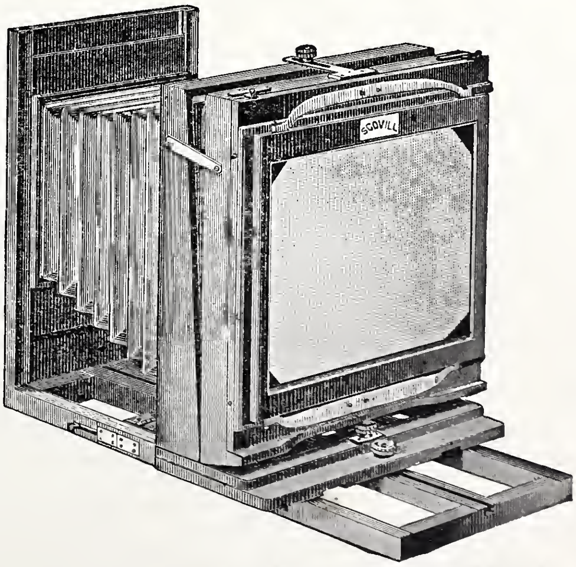
Factory at Berlin (Germany).

A NEW CAMERA

"The Reversible Landscape"

MADE BY THE AMERICAN OPTICAL CO.

To meet the demand for high-grade apparatus at popular prices. This camera is made of highly polished mahogany, with all the latest improvements, and patent self-adjusting ground glass frame, reversible back, and rising front.



PRICES:

6½ x 8½	Double Swing	$23.00
8 x 10	" "	25.00
11 x 14	" "	35.00
14 x 17	" "	50.00

THE SCOVILL & ADAMS CO. OF N. Y., 60 and 62 East 11th Street.

The Scovill & Adams Co.

Of New York.

60 & 62 East Eleventh Street, N. Y.

Are Trade Agents for and Supply:

THE GOERZ (NEW) DOUBLE ANASTIGMAT LENSES (Patented).
THE MORRISON FAMOUS WIDE ANGLE LENSES.
THE CELEBRATED WATERBURY (SINGLE ACHROMATIC) LENSES.

⁂

THE AMERICAN OPTICAL COMPANY'S APPARATUS.
THE FLAMMANG-SCOVILL-LEVY SCREEN PLATE-HOLDERS (Patented).
ALL STANDARD PHOTO-ENGRAVING GOODS.
SCOVILL REVERSING APPARATUS.
SCOVILL THREE-COLOR SCREENS.

⁂

HAMMER DRY PLATES.
THREE CROWN ALBUMEN PAPER.
EMPIRE COLLODION GLOSS (ARISTOTYPE PAPER).
EMPIRE COLLODION MATT (ARISTOTYPE PAPER).
EMPIRE GELATINE (ARISTOTYPE PAPER).

⁂

"DIXEY" VIGNETTERS.
SCOVILL (Patented) ZINC ADJUSTABLE WASHING BOXES.
SCOVILL (Patented) MAGNESIUM CARTRIDGES.
THE "WORLD" SPECIAL PHOTO-FINISH BLOTTING PAPER.
"SWEETHEART" ADHESIVE CLOTH.

⁂

S. P. C. CHEMICALS AND PREPARATIONS.
MERCK'S PYRO.
"NON-COCKLE" MOUNTING PASTE.
REIFSCHNEIDER'S "ECLIPSE" AND "REGENT" ALBUMS.
WATERBURY CARDBOARD.

⁂

THE SCOVILL PHOTOGRAPHIC SERIES OF PUBLICATIONS.
THE AMERICAN ANNUAL OF PHOTOGRAPHY.
THE PHOTOGRAPHIC TIMES (MONTHLY).
THE PRACTICAL PROCESS WORKER (MONTHLY).
EL PROGRESO FOTOGRÁFICO (MONTHLY).

Descriptive Catalogues and Special Price Lists on application.

Correspondence Solicited

THE EMBLEM

OF

PERMANENCY!

EIGHT YEARS' RECORD
HAS PROVEN IT SO.

The
Best printing-out papers, Aristo Platino, Aristo Jr., and Aristo Blue Label,
All Pure Collodion.

Manufacturers:
American Aristotype Co.,
Jamestown, N. Y.

Trade Agents:
E. & H. T. Anthony & Co.,
New York and Chicago.

Color ......
Photography
.... A Fact.

* * *

Any Amateur can take a Colored Photograph, in the colors of Nature, with his present Camera.

* * *

OUTFITS ARE NOW ON SALE.

* * *

Send for descriptive circular to

JOLY-SAMBRA CO., Montclair, N. J.,

or to the Agents,

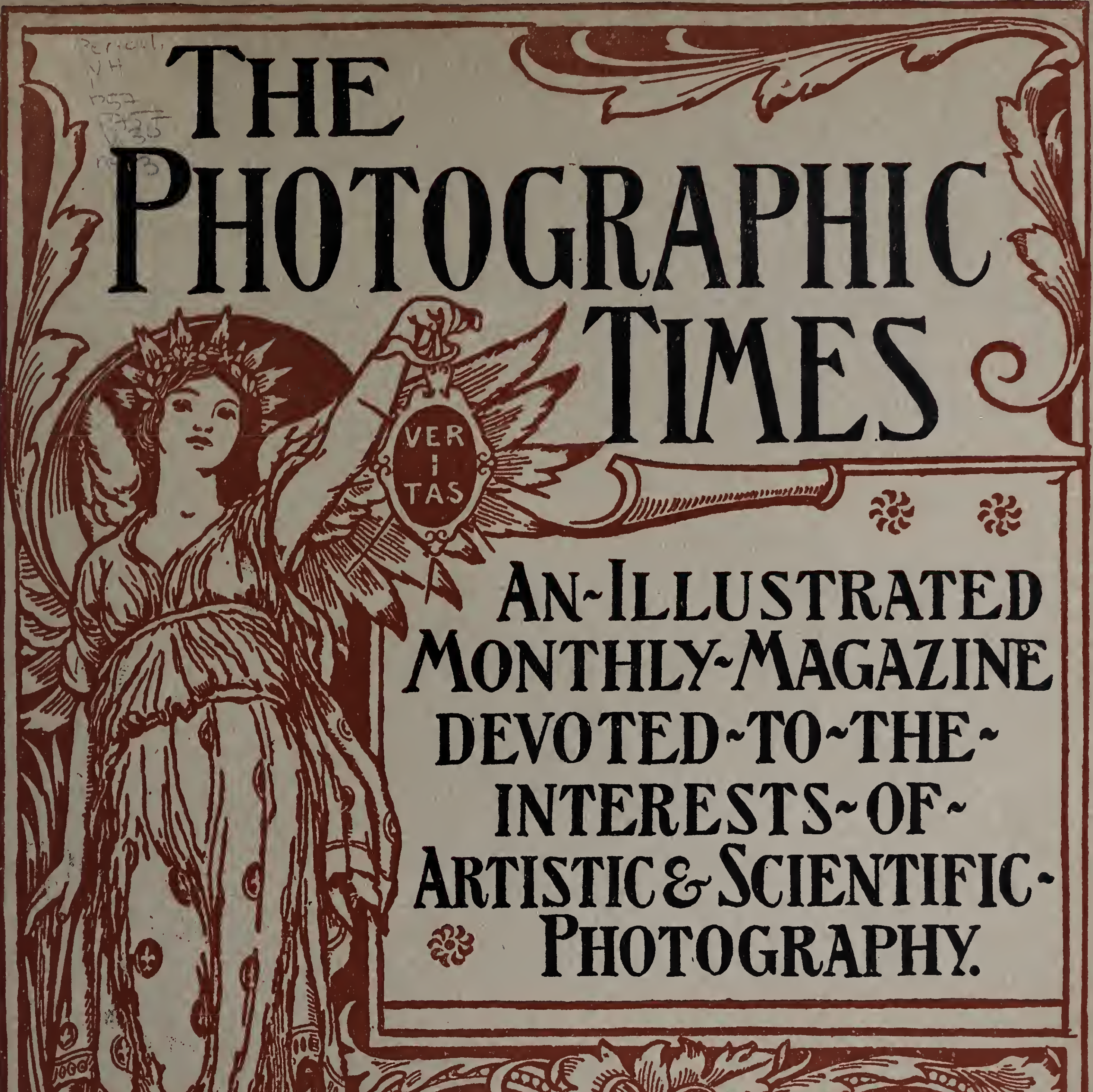
The Scovill & Adams Co. of New York,

60 EAST ELEVENTH STREET, NEW YORK.

Vol. XXX.
FOUR DOLLARS PER ANNUM.
MARCH, 1898.
Number 3.
SINGLE COPIES, 35 CENTS.

Period.
NH
1
P57
P735
v.30
no.3

THE PHOTOGRAPHIC TIMES



AN ILLUSTRATED MONTHLY MAGAZINE DEVOTED TO THE INTERESTS OF ARTISTIC & SCIENTIFIC PHOTOGRAPHY.

THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION 60 AND 62 EAST 11TH. ST. NEW YORK.

CONTENTS.

PAGE
Frontispiece—Sheep Study near Bordyhesa—By Her Grace the Duchess of Sermoneta.
Photographic Studies of Live Birds—By R. W. Shufeldt ... 97
Gambel's Partridge—By R. W. Shufeldt—Illustration ... 98
Chestnut-bellied Scaled Partridge—By R. W. Shufeldt—Illustration ... 99
Sparrow Hawk—By R. W. Shufeldt—Illustration 100
Copperas Creek Dam—By L. C. Sonneman—Illustration ... 101
On Color Photography—By J. Stewart Gibson—Illustrated ... 101
Autobiographical Sketches—By H. P. Robinson ... 104
Bringing Home the May—By H. P. Robinson—Illustration ... 105
Autumn—By H. P. Robinson—Illustration ... 106
Palestine Photographically Considered—By Robert E. M. Bain ... 108
Horns of Hattin, near Tiberius, Sea of Gallilee, Syria—By R. E. M. Bain—Illustration ... 108
Jacob's Well, Jerusalem, Palestine—By R. E. M. Bain—Illustration ... 109
Pools of Solomon, Bethlehem, Palestine—By R. E. M. Bain—Illustration ... 109
Castle of Cæsarea Philippi, Syria—By R. E. M. Bain—Illustration ... 110
Military Road, Damascus—By R. E. M. Bain—Illustration ... 111
A New System of Flash-Light Photography—By Lyman G. Bigelow—Illustration ... 111
General View of Studio—Illustration ... 112
Flash-light Portrait—By S. G. Bigelow ... 113
The Perforations—By C. Francis Jenkins—Illustrated 113
Willow Warblers—By Chas. Reid—Illustration ... 114
The Moon—By L. M. Rutherford—Illustrations ... 115
PAGE
The Photograph and the Painting—By Clement Hopkins ... 116
"Entre Nous"—By Clement Hopkins—Illustration. 116
"In Memoriam"—By Clement Hopkins—Illustration 117
Miss Druscilla Cutler (Mrs. Harold Child)—By Clement Hopkins—Illustration ... 118
The Successful Development of Hand-Camera Exposures and Instantaneous Work—By B. O. B. . 119
Going to Market—By Clarence H. White—Illustration 119
Naturalistic Photography—By P. H. Emerson ... 121
Artistic Photography ... 125
Hilltop Farm—By W. I. Lincoln Adams—Illustration 125
Evening Shadows—By W. I. Lincoln Adams—Illustration ... 127
Study—By J. R. Swain ... 128
Child Study—By C. G. Appleton—Illustration ... 128
Editorial Notes ... 129
Tesla's Latest Advances in Vacuum-tube Lighting —Illustration ... 129
Tesla's Latest Advances in Vacuum Tubes—Illustration ... 131
Arrow Arum—By H. Troth—Illustration ... 132
View of Littleton, N. H.—By B. W. Kilborn—Illustration ... 133
Prizes for Photographs of Sculpture ... 134
Ortol—By Andrew Pringle ... 134
Negative Improvements—By W. Ethelbert Henry. . 135
Notes and News ... 136
Trade Notes ... 140
The Editor's Table ... 141
Answers to Correspondents ... 142
Our Competitions ... 143
The Parting Pilot—By H. Troth—Illustration ... 143
Patents of the Month ... 144
THE ENCYCLOPÆDIC DICTIONARY OF PHOTOGRAPHY ... 433

INSOLUBLE AND NONCURLING,

STRICTLY FIRSTCLASS IN EVERY RESPECT.

THE GETTY CENTER
LIBRARY

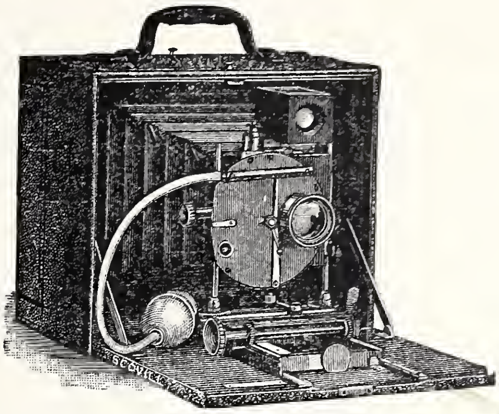
CAMERAS FOR NOTHING.

Our Special Offer.

TO ANYONE sending us twenty-five yearly subscriptions for this magazine we will give **Free of all charge** a beautiful 4 x 5 **Henry Clay Camera** complete with lens, shutter, etc,,

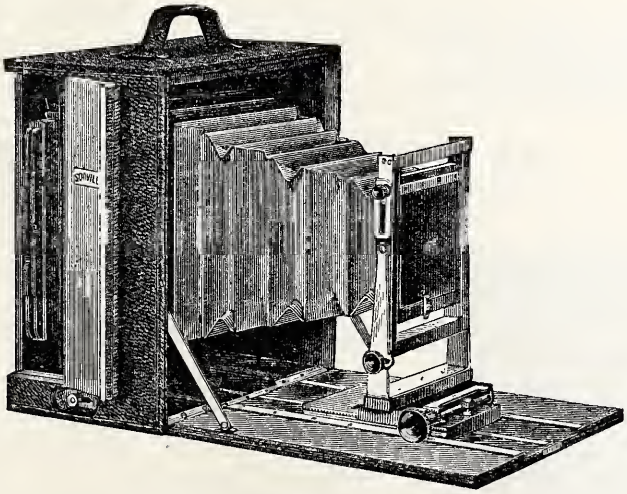
TO ANYONE sending us fifty yearly subscriptions to this magazine we will give **free of all charge** a magnificent 8 x 10 **Irving Clay Camera.**

BOTH these cameras are marvels of workmanship and the finest grade of apparatus manufactured by the American Optical Co.



4 x 5 Henry Clay Camera,

For 25 Subscriptions to The Photographic Times.



8 x 10 Irving Clay Camera,

For 50 Subscriptions to The Photographic Times.

Send in your subscriptions as you receive them and they will be credited to your account.

Each subscription must be accompanied with the cash in payment therefor.

Two half-year or four quarterly subscriptions will count as one year's.

Give full name and address of subscriber. One yearly subscription costs $4.00, half-yearly $2.00, and quarterly $1.00.

The Photographic Times Publishing Association,

60 and 62 East 11th Street, New York.

THE NEW TRIUMVIRATE

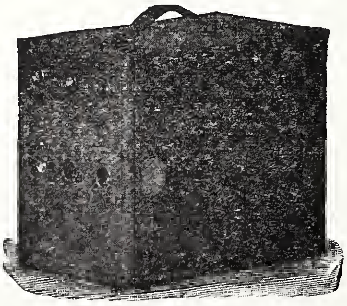
FOR 1898

HENRY CLAY

KLONDIKE

SOLOGRAPH

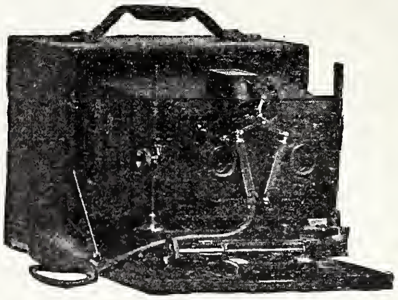
Scovill high grade
CAMERAS
at popular prices



KLONDIKE, PRICE $5.

Send for description of these Cameras.

SOLOGRAPH 4 x 5, PRICE $35.



HENRY CLAY, PRICE $85.

THE SCOVILL & ADAMS CO. OF N. Y.
60 and 62 East 11th Street, New York.

SECOND EDITION - - THIRD THOUSAND.

"Sunlight and... Shadow"

A BOOK FOR PHOTOGRAPHERS,

.....AMATEUR AND PROFESSIONAL.....

BY W. I. LINCOLN ADAMS.

Containing Chapters and Illustrations by such well-known photographic writers and workers as

H. P. ROBINSON,
ALFRED STIEGLITZ,
A. HORSLEY HINTON,
R. EICKEMEYER, Jr.,
W. B. POST,
J. WELLS CHAMPNEY,
B. J. FALK,
ALEXANDER BLACK,
W. A. FRASER,
HER GRACE THE DUCHESS OF SERMONETA,
and the MARQUIS DE ALFARRAS.

It covers the field entirely, as shown by the following

Contents

THE CHOICE OF SUBJECT.
LANDSCAPE WITHOUT FIGURES.
LANDSCAPE WITH FIGURES.
FOREGROUNDS.
THE SKY.
OUT-DOOR PORTRAITS AND GROUPS.
THE HAND CAMERA.
INSTANTANEOUS PHOTOGRAPHY.
WINTER PHOTOGRAPHY.
MARINES.
PHOTOGRAPHY AT NIGHT.
LIGHTING IN PORTRAITURE.
PHOTOGRAPHING CHILDREN.
ART IN GROUPING.

About 150 pages of the most instructive and entertaining reading matter,

....AND....

: : : More than 100 Beautiful Photo Engravings : : :

MANY OF THEM FULL-PAGE PICTURES.

Printed on Heavy Wood-cut Paper, with liberal margins and gilt edges.
Beautifully and Substantially bound in Art Canvas, with gilt design.

PRICE, IN A BOX, $2.50

Sent post free by mail, to any address, on receipt of amount by

The Scovill & Adams Company of New York,

60 and 62 East Eleventh Street, New York City.

"Sunlight and Shadow."

Following are some extracts from reviews of greater or lesser length, which have recently appeared in the public press in regard to "**Sunlight and Shadow**" by W. I. Lincoln Adams. We have only room for the merest extracts.

"It would be an appropriate gift to a friend interested in photography as an amateur."—*Cleveland Plain Dealer.*

"The book contains a hundred exquisite half-tone engravings."—*Baltimore American.*

"For the photographer who desires to advance in pictorial photography, these articles and illustrations by some of the best photographers in landscape and studio art, gathered by the author of this volume, are full of helpful suggestions and aid to acquiring some degree of skill in the art. All the difficult points are dealt with." —*Providence Journal.*

"The friend of the kodak fiend. Can you do him a greater kindness than to remember him at Christmas with a copy of 'Sunlight and Shadow'"?—*Detroit Free Press.*

"The mechanical work is excellent and it is a marked additional beauty to the many illustrations."—*Chicago Inter-Ocean.*

"Although the work seems almost too fine to handle, it is thoroughly practical. It is profusely and exquisitely illustrated, and the photographer who possesses it will find it not only a thing of beauty in itself, but a work of profit."—*Boston Transcript.*

"The volume is a model of fine printing, is full gilt and tastefully bound; just the present for an ardent camerist."—*Buffalo Express.*

"Everyone interested in the growth of photography will welcome this work."—*Arts for American.*

"It deals practically with themes of vital interest and they are handled with expert ability, while the pictures are the best reproductions we have ever seen."—*Congregationalist.*

"Pleasure as well as profit awaits the owner of this handsome volume."—*Philadelphia Ledger.*

"No more acceptable gift could be made to an amateur photographer than a copy of 'Sunlight and Shadow.'"—*Philadelphia Press.*

"Attractive, clean and fertile in suggestions to the owner of the camera."—*Milwaukee Sentinel.*

"It shows that improvement may be done in book illustration by the skilful camera artist."—*San Francisco Chronicle.*"

"If any one questions the fact that photography is becoming a fine art he only needs to look over the charming pages of this volume and study the handsome illustrations."—*Evangelist.*

"It seems hardly decent to resist any longer the claim certain phases of photography have to acceptance as high art."—*Current Literature.*

"The illustrations which are so handsome as to make the volume an artistic treasure, aside from its helpfulness, are made from original photographs from nature." —*The Interior.*

"An excellent book for the amateur photographer who has made some progress in the practice of his art, and may be quite as useful to the professional."—*The Art Amateur.*

"Its recommendations are universally judicious and practical."—*The Critic.*

"It contains valuable information as to the best methods of reaching perfection in photography."—*Minneapolis Tribune.*

"All very tasteful, very attractive."—*Literary News.*

A Selected List of Books

From the Scovill & Adams Co. of New York Book Catalogue.

	Price per copy
Amateur Photography. A Practical Guide for the Beginner. By W. I. Lincoln Adams. Illustrated. Paper covers, 50c.; cloth bound	$1 00
Lantern Slides and How to Make Them. By A. R. Dresser. A new book, very complete and practical	25
Photography at Night. By P. C. Duchochois. Illustrated. 108 pp. Paper covers	1 00
The Knack. Written expressly to help the beginner in perplexity, reduced to	25
Photographic Lenses; Their Choice and Use. By J. H. Dallmeyer. A special edition, edited for American photographers. In paper covers	25
The Chemistry of Photography. By Prof. Raphael Meldola	2 00
The Photographic Image. By P. C. Duchochois. A Theoretical and Practical Treatise on Development. Paper covers Cloth bound	1 50 2 00
The Ferrotyper's Guide. For the ferrotyper, this is the only standard work. Seventh thousand	75
The Photographic Studios of Europe. By H. Baden Pritchard, F.C.S. Cloth bound, $1.00; paper covers	50
History and Hand-Book of Photography. With seventy illustrations. Cloth bound, reduced to	50
Crayon Portraiture. Complete instructions for making Crayon Portraits on Crayon Paper and on Platinum, Silver and Bromide Enlargements; also directions for the use of Transparent Liquid Water Colors, and for making French Crystals. By J. A. Barhydt. A new edition. Paper covers Cloth bound	 1 00
Art Recreations. Ladies' popular guide in home decorative work, with a chapter on photography. Edited by Marion Kemble	1 00
The Photographer's Book of Practical Formulas. Compiled by Dr. W. D. Holmes, Ph.B., and E. P. Griswold. Paper covers, reduced from 75c. to 30c.; cloth bound, reduced from $1.50 to	60
American Hand-Book of the Daguerrotype. By S. D. Humphrey. (Fifth Edition.) This book contains the various processes employed in taking heliographic impressions	25
"Sunlight and Shadow" a book for Photographers, Amateurs and Professionals. By W. I. Lincoln Adams. Illustrated with over 100 handsome photo-engravings. Beautifully and substantially bound. Price in a box	2 50

Simplex Print Trimmer.

⁂

Cheaper than any other.

Better than all the others.

⁂

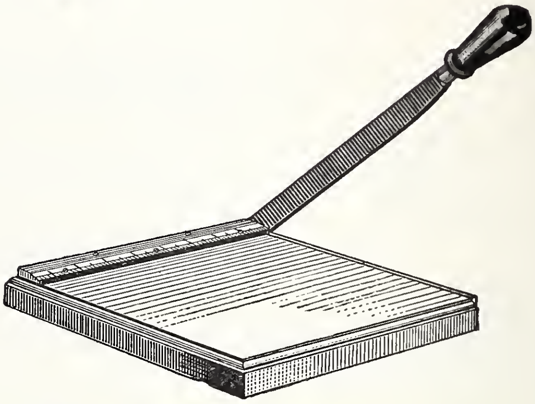
In the manufacture of this Trimmer we have given special attention to the knives, with the result that they are more evenly tempered, and better adjusted than those costing double.

COMPARE OUR PRICES WITH ALL THE OTHERS.

No. 0. 7 inch blade	*$2 00.*
No. 1. 8½ inch blade	*2 25.*
No. 2. 10 inch blade	*2 50.*

Discount to the trade upon application to

THE SCOVILL & ADAMS CO. OF NEW YORK,
60 and 62 East 11th Street.



ARE YOU A SUBSCRIBER
TO THE

St. Louis & Canadian Photographer?

NO?

WELL, YOU ARE BEHIND THE TIMES.

Send 50 Cents at once for a

3 MONTHS' TRIAL TRIP.

EVERY NUMBER HANDSOMELY ILLUSTRATED.

Amateurs like it. Professionals cannot do without it.

"I wish you success in the new Editorship, and hope that the good work of the Journal will go on, and that it will still continue to uphold and build up the legitimate photo business."
C. P. McDANNELL,
Cambridgeboro, Pa.

"Why, of course, we wish to renew. You would not expect us to try and run business without it."
E. LONG & SON,
Quincy, Ill

$3.00 per Year, $1.50 for Six Months.

Mrs. FITZGIBBON-CLARK,
2714 Olive St., ST. LOUIS, MO.

SUBSCRIPTIONS RECEIVED BY ALL DEALERS.

WANTED

FREAK PHOTOS

Caricature Portraits and other Photographic Curiosities. A liberal price will be paid. Address L L., Care Editor,

THE PHOTOGRAPHIC TIMES
60 and 62 East 11th St., New York,

The S. & A. Photographic Series.

	Price per copy.
No. 5. **Photography with Emulsions.** By CAPT. W. DE W. ABNEY, R.E., F.R.S. A treatise on the theory and practical working of Gelatine and Collodion Emulsion Processes. (Second Edition.) Paper covers	75
No. 7. **The Modern Practice of Retouching.** As practiced by M. Piquepé, and other celebrated experts. (Ninth Edition.) Paper Covers	50
No. 8. **The Spanish Edition of How to Make Pictures.** Ligeras Lecciones sobre Fotografia Dedicados a Los Aficionados. Cloth bound, 75 cents. Paper covers	50
No. 12. **Hardwich's Photographic Chemistry.** A manual of photographic chemistry, theoretical and practical. Ninth Edition. Edited by J. TRAILL TAYLOR. Leatherette binding	2 00
No. 13. **Twelve Elementary Lessons on Silver Printing.** (Second Edition.) Paper covers	50
No 14. **About Photography and Photographers.** A series of interesting essays for the studio and study, to which is added European Rambles with a Camera. By H. BADEN PRITCHARD, F.C.S. Paper covers	50
Cloth bound (Library Edition)	75
No. 15. **The Chemical Effect of the Spectrum.** By Dr. J. M. EDER. Cloth bound, 50 cents. Paper covers,	25
No. 21. **The American Annual of Photography and Photographic Times Almanac for 1887.** (Second Edition.) Paper cover; (postage, 12 cents additional).	50
Library Edition; (postage, 12 cents additional)	1 00
No. 22. **Photographic Printing Methods.** By the Rev. W. H. BURBANK. A Practical Guide to the Professional and Amateur Worker. Paper. (Third Edition).	1 00
No. 23. **A History of Photography.** Written as a practical guide and an introduction to its latest developments. By W. JEROME HARRISON, F.G.S., and containing a frontispiece of the author. Cloth bound	1 00
No. 24. **The American Annual of Photography and Photographic Times Almanac for 1888.** Illustrated. (Second Edition.) Paper; (by mail, 12 cents additional.)	50
Library Edition; (by mail, 12 cents additional)	1 00
No. 25. **The Photographic Negative.** A Practical Guide to the Preparation of Sensitive Surfaces by the Calotype, Albumen, Collodion, and Gelatine Processes, on Glass and Paper, with Supplementary Chapter on Development, etc., by the REV. W. H. BURBANK. Cloth bound. Reduced from $1.50 to	1 00
No. 26. **The Photographic Instructor for the Professional and Amateur.** Being the comprehensive series of Practical Lessons issued to the Students of the Chautauqua School of Photography. Revised and enlarged. Edited by W. I. LINCOLN ADAMS, with an Appendix by Prof. CHARLES EHRMANN. (Fifth Edition, enlarged and revised.) Paper Covers.	1 00
No. 27. **Letters on Landscape Photography.** By H. P. ROBINSON. Finely illustrated from the Author's own photographs and containing a Photogravure Frontispiece of the Author. Cloth bound	1 50
No. 29. **The Processes of Pure Photography.** By W. K. BURTON and ANDREW PRINGLE. A standard work, very complete and freely illustrated. Price, in paper covers, $2.00. Library Edition	2 50
No. 30. **Pictorial Effect in Photography.** By H. P. ROBINSON. A new edition. Illustrated. Mr. Robinson's first and best work. Cloth bound	1 50
No. 32. **Practical Photo-Micrography.** By ANDREW PRINGLE. Fully illustrated. Cloth bound	$2 50
No. 33. **The American Annual of Photography and Photographic Times Almanac for 1890.** Paper cover (by mail, 14 cents additional)	50
Library Edition (by mail, 14 cents additional)	1 00
No. 34. **The Optical Lantern.** Illustrated. By ANDREW PRINGLE. In paper covers	1 00
Cloth bound	1 50

The S. & A. Photographic Series.

(Continued.)

	Price per copy.
No. 35. **Lantern-Slides by Photographic Methods.** By Andrew Pringle. In paper covers	75
Cloth bound	1 25
No. 36. **The American Annual of Photography and Photographic Times Almanac for 1891.**	
Paper cover (by mail, 15 cents additional)	50
Library Edition (by mail, 15 cents additional)	1 00
Cyclopedic Index for 1891 Annual	10
No. 37. **Photographic Optics.** A Text Book for the Professional and Amateur. By W. K. Burton. Paper	1 00
Library Edition	1 50
No. 38.—**Photographic Reproduction Processes.** Illustrated. By P. C. Duchochois. Paper	1 00
Cloth	1 50
No. 39. **El Instructor Fotografico.** Paper covers, $1.00 Library edition	1 50
No. 41. **The Chemistry of Photography.** By W. Jerome Harrison. Cloth bound	3 00
No. 42. **Picture-Making in the Studio.** By H. P. Robinson. Paper	50
Cloth bound (Library edition)	1 00
No. 43. **The American Annual of Photography and Photographic Times Almanac for 1893.**	
In Paper covers. Postage, 15 cents extra	50
Cloth bound (Library edition). Postage 15 cents extra	1 00
No. 44. **The Lighting in the Photographic Studio.** By P. C. Duchochois. A new edition. In paper covers	75
Cloth bound (Library edition)	1 00
No. 45. **The Grammar of Photo-Engraving.** By H. D. Farquhar. Illustrated. The most complete text book yet published on this subject. Price, in paper covers	2 00
Cloth bound (Library edition)	2 50
No. 46. **Industrial Photography.** Illustrated. By P. C. Duchochois. Being a description of the various processes of producing Indestructible Photographic Images on Glass, Porcelain, Metal, and many other substances. Paper Covers, 50 cents. Cloth bound	1 00
No. 47. **The American Annual of Photography and Photographic Times Almanac for 1894.** Edited by W. I. Lincoln Adams. In Paper Covers. Postage, 15 cents extra	50
Cloth bound (Library Edition). Postage, 15 cents extra	1 00
No. 48. **Aristotypes, and How to Make Them.** Giving a complete description of the manufacture and treatment of Gelatino and Collodio-Chloride Papers. By Walter E. Woodbury. Illustrated. In Paper Covers	1 50
Cloth bound (Library edition)	2 00
No. 49. **The Encyclopedic Dictionary of Photography. Containing ovor 2,000 references and more than 500 illustrations. The completest work of the kind ever issued. By Walter E. Woodbury, Editor of the Photographic Times.** In cloth	5 00
No. 50. **The American Annual of Photography and Photographic Times Almanac for 1895.** With over 200 illustrations. Edited by Walter E. Woodbury, Editor of "The Photographic Times." In Paper Covers. Postage, 15 cents extra	50
Cloth bound (Library Edition)	1 00
No. 51. **The Photo-Gravure.** By Henry R. Blaney. A very complete and practical book, written by an Expert. In paper covers, 50 cents. Cloth bound (Library edition)	1 00
No. 53. **The Annual, '96.** "The American Annual of Photography and Photographic Times Almanac for 1896," with 200 illustrations. Edited by Walter E. Woodbury, Editor of The Photographic Times. In paper cover, 75 cents; in cloth bound	1 25
No. 54. **Half-Tone by the Enamel Process.** By Robert Whittet. Fully illustrated and very complete. Price, in paper cover, 50 cents. Library edition	1 00
No. 55. **Instantaneous Photography.** By Capt. Abney, the great authority. Price in paper covers	75
No. 56. **Photographic Amusements.** By Walter E. Woodbury, Editor of The Photographic Times Second edition, including a number of novel and curious effects obtainable with the camera. In paper covers, $1.00. Cloth	1 50

For sale by all dealers in Photographic goods, booksellers, and sent, postpaid, on receipt of price, by the publishers,

THE SCOVILL & ADAMS CO. OF NEW YORK,

60 and 62 East 11th Street, New York.

SUBSCRIPTION FORM.

THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION,
60 and 62 East 11th Street, New York,

Gentlemen: Please send THE PHOTOGRAPHIC TIMES for .... year, commencing .... 189 , for which I enclose .... dollars.

Name ....

Address ....

....

The Leading Photographic Magazine of the World.

TERMS CASH.—To avoid all risks, we prefer remittances by Express, Money Orders, Draft on New York, Post Office Money Orders, Postal Notes, or Registered Letter.

MOSAICS, 1898

IS NOW READY.

Full of Good Things from Cover to Cover.

OVER FIFTY FULL PAGE PICTURES FROM PHOTOGRAPHS BY

STRAUSS, (St. Louis); HOLLINGER, (N. Y.); SCHUMACHER, (Los Angeles); J. F. RYDER, (Cleveland); LANDY, (Cincinnati); PLACE, (Chicago); PACH BROS., (N. Y.); ROOT, (Chicago); STIEGLITZ, (N. Y.); CORE, (N. Y.); MORRISON, (Chicago); GILBERT & BACON, (Philadelphia); ROSCH, (St. Louis); KUEBLER; (Philadelphia); BETZ, (Baltimore); ROSE, (Providence); MINNS; BRUSH, (Minneapolis); KELLMER, (Hazleton); HURD, (Providence); RANDALL; McCRARY & BRANSON; HARRISON, Jr.; TINGLEY; SCHRIEVER, BAKER'S ART GALLERY; SOMERS; SPERRY,

AND A HOST OF OTHER PROMINENT PRIZE WINNERS.

PRACTICAL ARTICLES ON PRACTICAL SUBJECTS BY

BACHRACH; SHERMAN; RYDER; NICOL; MINNS, PUNNETT; ESTABROOKE; SPERRY; DR. SCHUMANN; XANTHUS SMITH; BEELES; Rev. T. PERKINS; CHAPMAN JONES; FARRAND,

and others whose writings are known as helpful.

A Complete, Concise Review of Photography in 1897, with Methods and Formula in detail.

No other Annual gives so representative a collection of the best photographs of the year, or so useful a selection of practical papers on photography.

Price, paper covers, post-free, - - Fifty Cents.
Library edition, cloth-bound, post-free, - $1.00.

EDWARD L. WILSON, 853 Broadway, New York.

THE ENCYCLOPAEDIC DICTIONARY OF PHOTOGRAPHY

Contains over 2000 References and more than 500 Illustrations will be ready in a few weeks.

The completest Reference book ever issued. Orders booked now by

THE SCOVILL & ADAMS CO. OF N. Y.
60 and 62 East 11th St., New York.

ST. LOUIS TO KANSAS CITY
AND THE
WEST
HOURS SAVED TO SOUTHWEST MISSOURI
AND KANSAS POINTS
WITH DIRECT CONNECTIONS FOR
COLORADO AND PACIFIC COAST POINTS
"THE COLORADO SHORT LINE"

C. G. WARNER, Vice-Pres't
W. B. DODDRIDGE, General Manager
H. C. TOWNSEND, Gen'l Pass'r and Ticket Agent
St. Louis Mo

Read
"Electricity,"
The Only Independent Electrical Journal
Published in the United States.
ALL THE ELECTRICAL and
FINANCIAL NEWS.
Latest Technical Articles by
Home and Foreign Writers.
☞ THE BEST ADVERTISING MEDIUM.
Published Weekly.
Subscription $2.50 per year. Address,
ELECTRICITY NEWSPAPER CO.,
136 Liberty St., New York.

EVERY
GOOD
PHOTOGRAPHER

Delights in good printing. Send for a copy of *The Printer and Bookmaker*, a journal devoted to Printing, Engraving, Illustrating, Bookmaking, Etc. It is pleasing to the eye, and instructive to the mind.

SUBSCRIPTION PRICE, $2.00 PER YEAR.

HOWARD LOCKWOOD & CO.,
143 Bleecker Street, New York.

Photographic
Everything
NEW STORE—Convenient
NEW STOCK—Complete
NEW PRICES—Lowest
NEW IDEAS from everywhere
NEW APPARATUS of all makers
NEW SUPPLIES of old staples
The Scovill & Adams Co. of New York
Nos. 60 and 62 East 11th St.
(Five doors from B'way)
Send 35 cents for a sample number of The Photographic Times, containing about 100 handsome photographic illustrations.

Sold Out
The 1898
American Annual of
Photography.
A few copies can still be obtained from a few dealers.

INTERESTED IN
ELECTRICITY?
Read The Electrical Engineer.
Published Weekly. Fully Illustrated. Convenient in Size.
ALL THE NEWS.
Sample Copy Free.
Electrical Engineering Leaflets.
An educational electrical work in three volumes—elementary, intermediate, and advance grades. $1.50 each.
THE ELECTRICAL ENGINEER,
Send for Book Catalogue. 120 Liberty St., New York.

Amateur Photography.
"A Practical Guide for the Beginner."
By W. I. LINCOLN ADAMS.
(Illustrated.)

This is a practical treatise for the beginner by one whose experience of, and immediate contact with, the needs of those who are using the camera, in and out of doors, both for pleasure and profit, especially fits him to Help the Beginner.

It will be sent, post-paid, in paper covers on receipt of Fifty Cents.

In handsome Red Cloth Binding, with Gilt Lettering. One Dollar.

Get the Permanent Cloth Binding.

This Book is now in its Third Edition and Sixth Thousand. You cannot afford to be without it.

THE SCOVILL & ADAMS COMPANY OF N. Y.

New Things Photographic
all come to our store. Some sell slowly, others quickly, but visitors can here see everything old and new and buy at lowest market prices for cash.

The Scovill & Adams Co. of New York
Nos. 60 and 62 East 11th St.
(Five doors from B'way)

Send 35 cents for a sample number of The Photographic Times, containing about 100 handsome photographic illustrations.

Short Stories.

One of the most Entertaining Periodicals Published.

BRIGHT. ❖ ***SPICY.***

Just the thing for the Traveler and Summer Resorter or the Hearth-Stone in Mid-Winter.

ALWAYS REFRESHING.

Advertisers reap great benefits from it and express unbounded satisfaction at the results of using its columns.

25 Cents a Copy on all News Stands.

Bryant Building, - 55 Liberty Street, - New York.

A Sample Copy Free if Advertisement is mentioned.

DON'T BE
"A BUTTON PRESSER,"
for he is a poor specimen of humanity who is contented to press the button, let others do the rest, and then claim the results as his own. To become a successful Photographer you must read

THE PHOTOGRAPHIC TIMES,
60 and 62 East 11th St., New York City.

Send 35 cents for a sample number, containing a beautiful photogravure frontispiece and from 50 to 100 illustrations, including reproductions of the works of the principal amateur and professional photographers fs the world.

The Practical Process Worker
and Photo-Mechanical Printer.

A Representative Monthly Magazine of American Process Work.

Fully Illustrated with Specimens of the Latest Achievements in the Art.

This periodical is conducted by practical men, who give their experience in the laboratory and workshop, not by mere theorists.

Subscription price per annum, 50 cents.
Single Copies, - - - 5 "

ADVERTISING RATES ON APPLICATION.

Edited by WALTER E. WOODBURY.
A. C. LAMOUTTE, Business Manager.

PUBLISHED BY The Scovill & Adams Co. of N. Y.,
60 & 62 East 11th Street, New York.

First Edition Sold Out within a few weeks.

SECOND EDITION NOW READY.

"Photographic Amusements"

By WALTER E. WOODBURY,

Editor of "The Photographic Times."
and "The American Annual of Photography."

Containing a Description of

A Number of Photographic Experiments and Novel Effects to be obtained with the Camera.

Invaluable to both the Amateur and Professional Photographer.

CONTENTS.

The Mirror and the Camera.
The Photo-Anamorphosis.
Statuette Portraits.
Magic Photographs.
Spirit Photography.
Photography for Household Decoration.
Leaf Prints.
To Make a Pen and Ink Sketch from a Photograph.
Photographs on Silk.
Photographs on Various Fabrics.
Photographs in any Color.
How to Copy Drawings.
Dry-Plates that Will Develop with Water.
Photographing the Invisible.
How to Make Photographs in a Bottle.
Caricature Photographs.
Photographing a Catastrophe.
Sympathetic Photographs.
Wide-Angle Studies.
Silhouettes.
Freak Pictures with a Black Background.
Freak Pictures by Successive Exposures.
Photographing Snow and Ice Crystals.
Photographing Ink Crystals.
Photographing Sea Weed.
Stamp Portraits.
Moonlight Pictures.
Floral Photography.
A Simple Method of Enlarging.
Distorted Images.
Luminous Photographs.
Photographs Without Light.
Electric Photographs.
Pinhole Photography.
Magic Vignettes.
Instantaneous Photography.
Photographing Fireworks.
Lightning Pictures.
The Photochromoscope.
Composite Photography.
Double Exposure Pictures
Tele-photographs.
Artificial Mirages.
Etc., etc., etc.

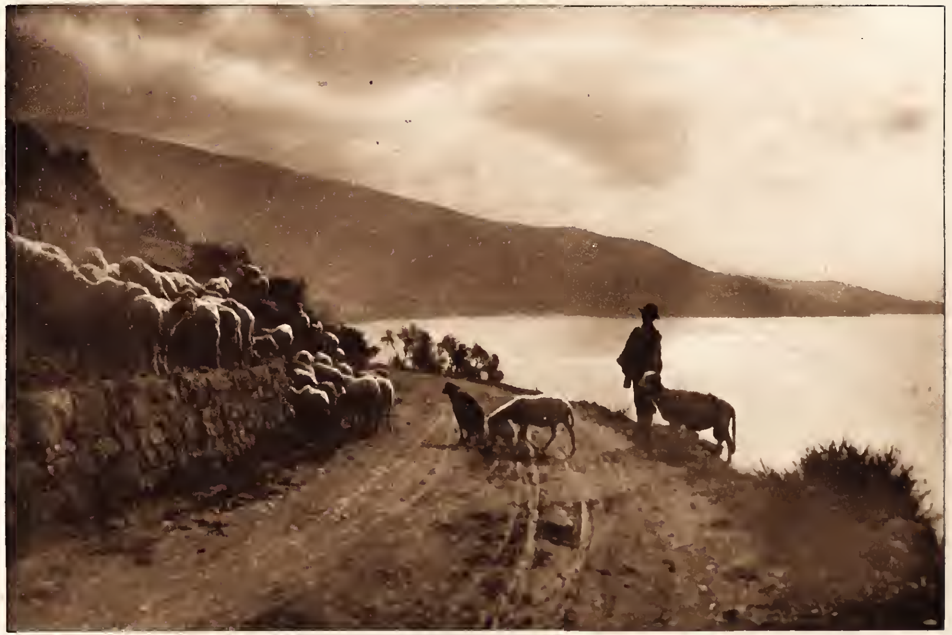
OVER ONE HUNDRED ILLUSTRATIONS.

Price, in Paper Covers, $1.00. Cloth, $1.50.

Sent post-paid on receipt of price by the Publishers,

THE SCOVILL & ADAMS COMPANY OF NEW YORK,
60 and 62 East Eleventh St., New York, N. Y.

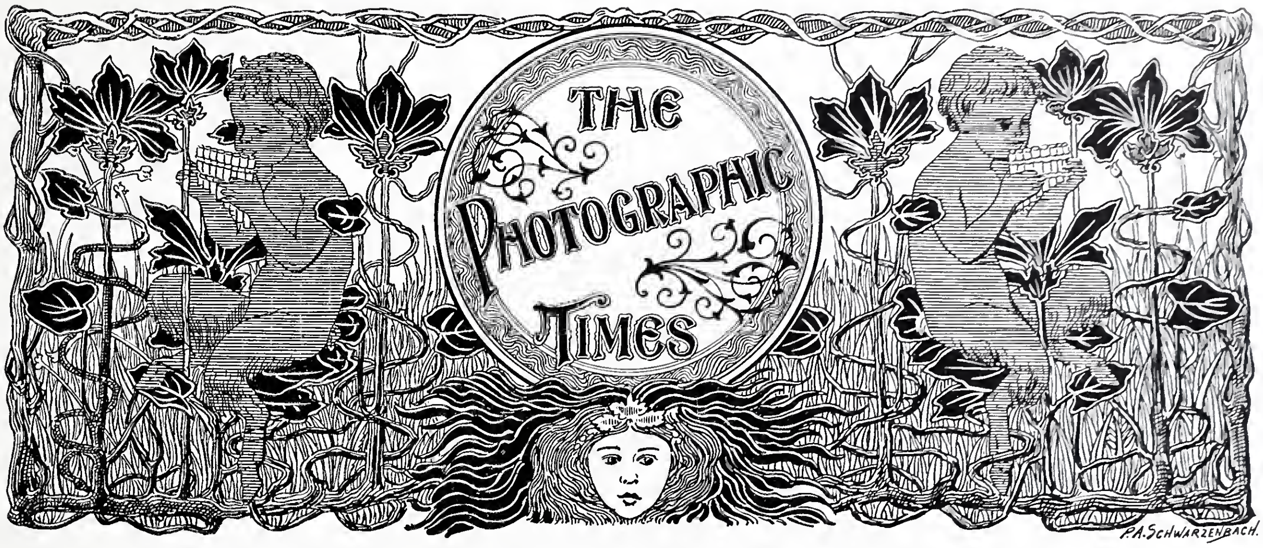
SEND FOR NEW CATALOGUE OF PHOTOGRAPHIC PUBLICATIONS.



GRAVURE-PHOTOCHROME ENG CO., NY

SHEEP STUDY NEAR BORDYHESA

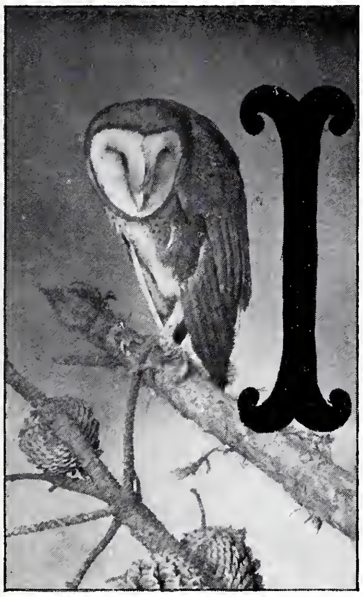
By Her Grace the Duchess of Sermoneta



VOL. XXX. MARCH, 1898. NO. 3.

PHOTOGRAPHIC STUDIES OF LIVE BIRDS.

BY R. W. SHUFELDT, C. M. Z. S., ETC.



IN Washington, as in many other large cities in this country, we meet with establishments where animals, birds, fish and the like are imported, bought and sold as pets, or as supplies for zoölogical gardens, or other purposes. When well conducted, such places are frequently resorts of great attraction, and many people visit them, if not always to buy, to at least see the numerous new forms that are constantly passing through the hands of the proprietor of such a menagerie. The best private emporium of this kind in Washington, D. C,, is the one owned by Mr. Edw. S. Schmid, and it is so managed that it may very properly be considered as one of the educational institutions of the city, in touch, as it is in a way, with the National Zoölogical Gardens, which has upon more occasions than one, secured some rare animal there. Very often Mr. Schmid has brought to him living wild specimens of mammals,birds,or reptiles from various parts of the United States or other countries, and these are cared for in large cages until disposed of, or by death fall into the hands of his taxidermist.

Being one of the most congenial and accommodating men I ever met in my life this establishment constantly supplies me with the most excellent material for my photographic studies of our birds and animals. Nearly every day something new comes in, and most always a recent capture, and as wild as the moment it left its native haunts. Owls are there, some-three or four species at a time ; partridges, too, various forms of them ; hawks likewise ; and a great many finches, doves, thrushes, parrots, and occasionally different species of water birds. Any of these I am at once permitted to have transported to my studio for the purpose of photographic study, and some of my best results have thus been secured, and pictures obtained that might never have otherwise been taken had it not been for the courtesy and generosity of Mr. Schmid.

During the latter part of December (1897) a large invoice of American partridges became available, they having been captured in the southern part of the United States by one of the field collectors of the establishment. These birds were nearly all in beautiful plumage, and represented three very distinct forms. There was the handsome Gambel's Partridge (*Callipepla gambeli*) (Fig. 1) ; the beautifully marked Chestnut-bellied Scaled Partridge (*Callipepla squamata castanogastis*) (Fig.2) ; and lastly our well-known Bob-White (*Colinus V. texanus*).

Copyright. 1897, by The Scovill & Adams Co. of New York. Entered as Second Class Matter at the New York, N. Y., Post Office.

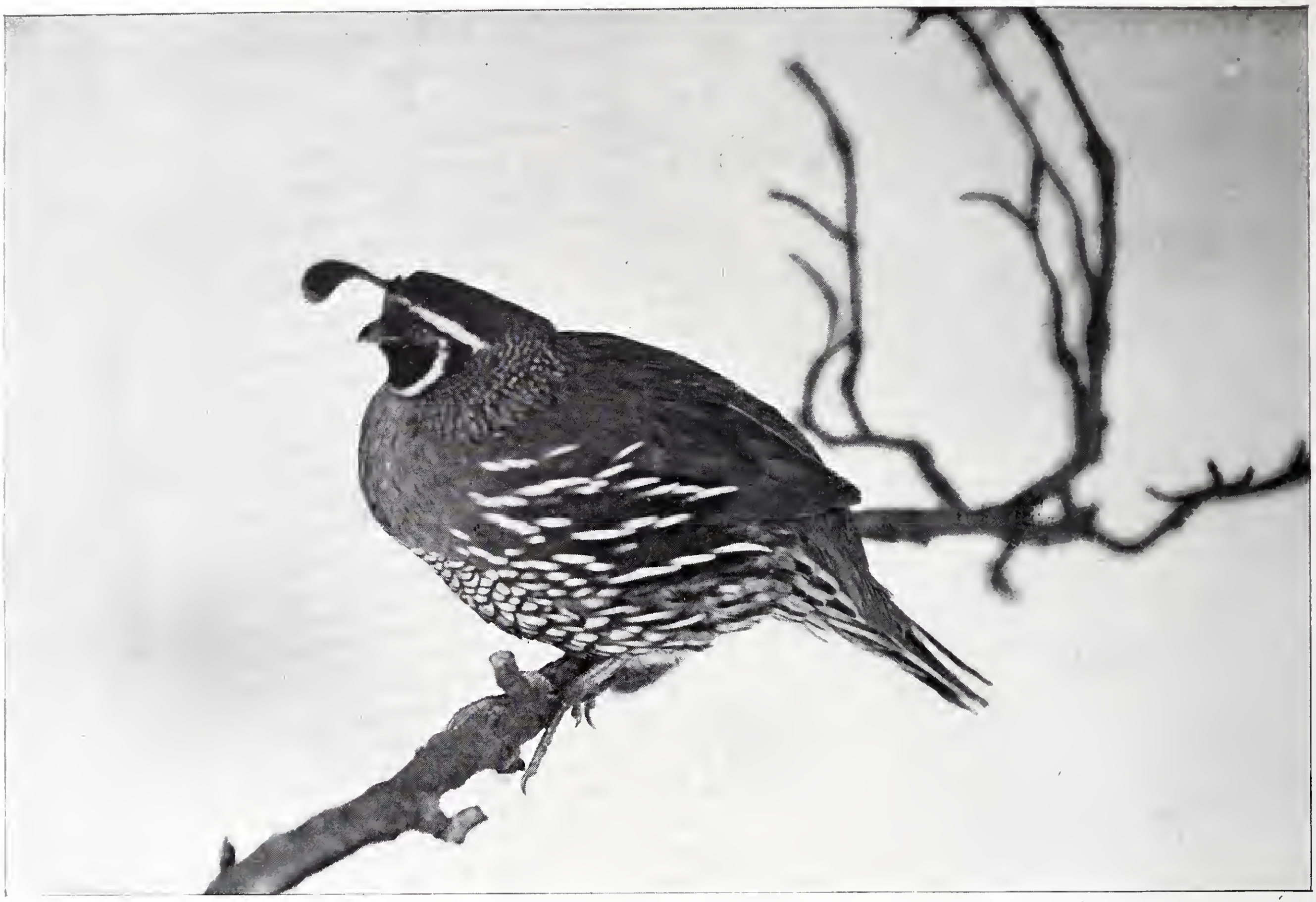


FIG. 1.—GAMBEL'S PARTRIDGE BY DR. R. W. SHUFELDT

All these came from Texas, and from them I was permitted to select as perfect examples as possible, and notwithstanding their extreme wildness and nervousness succeeded in carrying them over four miles to my home without accident.

Now the photography of live partridges is by no means an easy thing to accomplish under any circumstances, that is when the subjects are turned loose in a room devoted to the purpose. Extreme patience, and the utmost gentleness and tact must be constantly employed or else absolute failure is certain to be the result. First, it is necessary to gain the confidence of the birds, and this is best done by at once allowing them the freedom of the apartment. Here, of course, there will at the outstart be trouble, as frightened by their new surroundings they will run wildly about or even fly against the windows in their attempts to escape. In an hour or more, however, they will begin to become accustomed to your movements, and even at the end of that time be induced to stand upon a little branch held in your hand. All evidences on your part of too particularly noticing your subjects must be avoided, and it is better to move about, setting the camera and other accessories in place for work; keeping up at irregular intervals a low-toned "quail note," or whistle, than it is to enter too energetically upon the real task before you. As the birds quiet down you will observe that the several species are not only very differently dispositioned, but that they possess entirely different points about them that are essential to be exhibited in their pictures.

The best view for Gambel's Partridge (Fig. 1) is the direct lateral, for in it are shown the form of its peculiar crest; the remarkable flatness of the top of the head (a feature elsewhere pointed out by me); and the beautiful plumage, so conspicuously dashed with white on the side, as well as some of the similar markings below. In his drawing of the California Partridge, a species closely related to Gambels', Audubon portrayed both the shape of the head and the characters of the crest utterly incorrect, but he is to be excused for this as he doubtless never saw any of these western species of American partridges alive in his life. This is but another instance, however, where the camera can be thanked for correctly giving us the form and

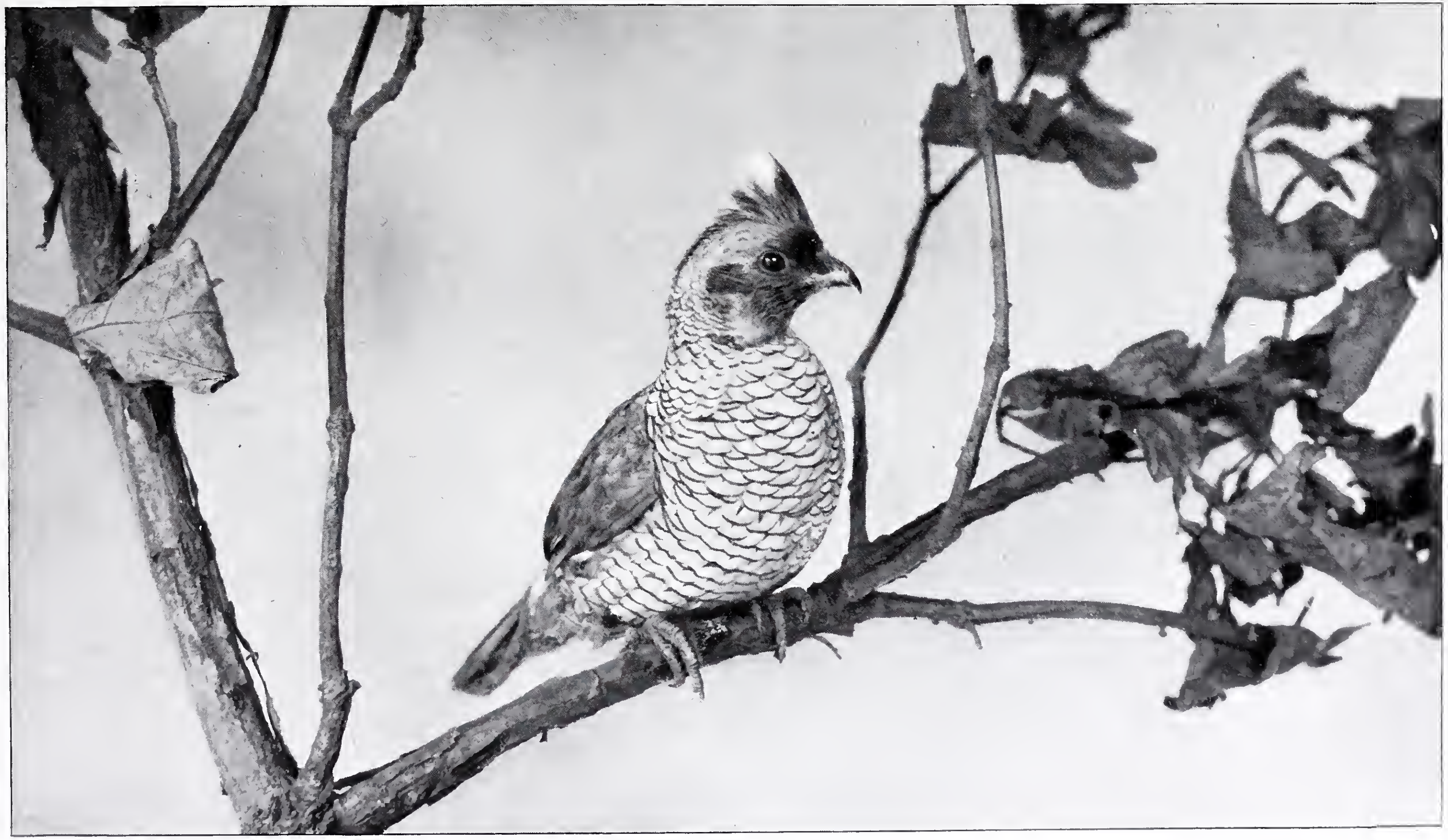


FIG. 2.—CHESTNUT-BELLIED SCALED PARTRIDGE

BY DR. R. W. SHUFELDT

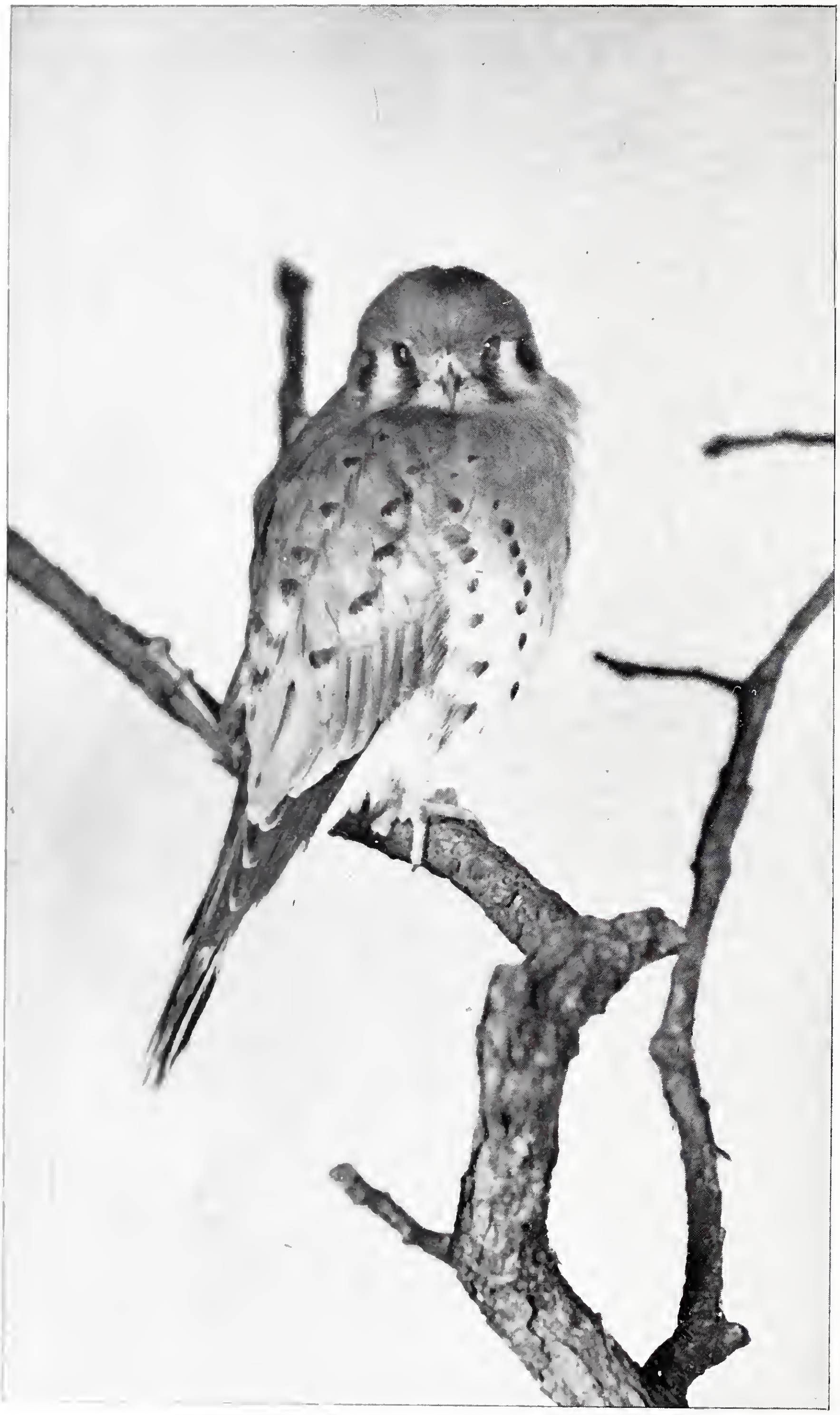


FIG. 3—SPARROW HAWK BY DR. R. W. SHUFELDT

outline of the bird, as compared with the highly uncertain work of the ornithological artist, with nothing to guide him save a dried skin of the species he desires to picture.

Now in photographing the Scaled Partridge (Fig. 2) we have an entirely different subject to deal with, in the matter of the characters to be shown. Its back and tail being of nearly a uniform slate gray, they can, as it were, be subordinated in its picture, whereas its peculiar crest, with its white center of feathers, and especially the beautiful black emargination of all the feathers of the breast, the sides of the neck, and the latero-inferior parts, are to be prominently shown. In order to effect this, a very careful study of the light must be made, and this so controlled as to largely eliminate nearly all the shadowing, only sufficient being apparent to insure the appearance of the form of the bird.

This I succeeded in doing most perfectly, and by producing a low chicking note, just prior to exposure, this very interesting and gentle little subject was induced to elevate its erest in the prettiest manner possible.

Great care had to be exercised, however, in both opening and closing the shutter, especially as the camera was not far away from the limb upon which this very watchful little Partridge had condescended to perch for me. Every movement in the room attracted its attention, and the very slightest noise imaginable caused it to elevate and lower its crest, with the same imperceptible motion seen in the opening and shutting of the wings in some species of butterflies. As the bird is taken more than half the size of life, it was, of course, necessary to use a diaphragm of small aperture, and to bring the camera close up, for a time exposure of at least two seconds. Here is where one of the difficulties came in, for it gave this bird, wonderfully quick by nature in all of its movements, an opportunity to produce any one of them prior to closing the shutter, thus spoiling a plate if it did so. In addition to the chicking noise I produced to cause it to elevate its crest, I kept up at the same time, both a few seconds before the exposure was made, and until the shutter was completely closed, a peculiar, very low, hissing sound, made by allowing expired air to escape between the middle pairs of incisor teeth. He appeared to be satisfied in an instant, however, that both of the sounds that had attracted his attention emanated from me, and fortunately, just at this point I got him. Partridges always look best and show the most character when their heads are taken *en profile*, rather than *en face*, in which view they are inclined to look a little owlish.

Falcons and Hawks, however, among the diurnal raptorial birds, often make fine pictures when their heads are taken directly upon anterior view. This is well-shown in my photograph from life, of the male sparrow-hawk (*Falco sparverius*) reproduced in Figure 3 of the present article.

This bird has a remarkable trait that renders the taking of his portrait a very uncertain operation. This consists in a quick and almost vertical jerking of the head, repeated several times in rapid succession,—a motion he resorts to when anything especially attracts his attention. They are restless little fellows too, and more than two hours were expended before a satisfactory exposure was made, during which time he flew about the room a good deal, and lit almost everywhere except upon the little branch I had prepared for him. Finally, I partially satisfied his hunger ; gave him a drink of water, and as he lit on the limb, I called his attention in the direction of the camera by squeaking under the focusing-cloth like to imitate a wounded nestling-bird,—and before he had a chance to duck his head at me forty times, I snapped the shutter on him.

COPPERAS CREEK DAM BY L. C. SONNEMAN

ON COLOR PHOTOGRAPHY. BY J. STEWART GIBSON, Ph.D.

COLOR PHOTOGRAPHY is a subject which enters into the domains both of physics and physiology. What the mind is cognizant of when the eye beholds Nature in all her varied hues is due to two distinct conditions. The first of these is purely physical, the result of the nature and particular state of matter and energy, and may exist perceived or unperceived, realized or not by the mind. The second, for the sake of distinction, may be called the physiological condition, by which is meant the function of the eye in interpreting to the mind the external reality.

There can be no question as to the impossibility of producing a perfect picture in natural color by any method which is not based on both the physical and physiological principles. The art of color photography in its present stage presents three more or less distinct lines of development. The first of these is Professor Lippmann's method, based on the interference of light waves, and is one of the most beautiful and extraordinary scientific achievements of the day, being all but a complete verification of the undulatory theory of light. The second, while very general and indefinite in its nature, is exceedingly interesting. Briefly stated, it is proposed in this method to produce a selective nature in the photographic films so that a correct distribution of three primary colored pigments will spontaneously occur as a result.

The third process differs essentially from the others in that it is developed principally from the physiological side. It is to Mr. Ives, of Philadelphia, and Professor Joly, of Dublin, that much credit is due for having worked out a practical application of this method, and their names are generally used in connection with it.

Space will not permit of an exhaustive discussion of the relative and absolute merits of these several methods. As to the Lippmann process, however, it is evident that the result obtained is an exact duplicate of the original in the physical sense as regards color, *i. e.*, the same kind of light-waves are emitted from the picture as were emitted from the original object. It may be asked, what possible objection or defect can there be then ? The answer is this, the lack of luminosity or brightness is fatal to it for all ordinary purposes. The picture must be illuminated with an equivalent of the noonday sun, and held at a particular angle, and even then is not wholly satisfactory.

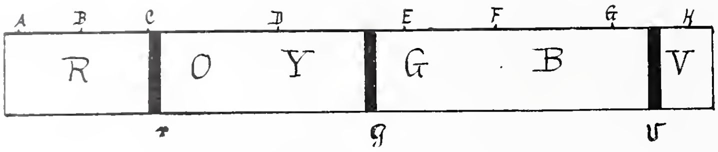


Fig. 1.

In fact there is in this a practical demonstration of what is on careful consideration theoretically apparent, that a photograph in color viewed by reflected light cannot have high luminosity provided the color detail is rendered as finely as structure detail is rendered photographically. In other words, an exact photograph in color can never have the degree of brightness that a painting or print in pigments has, in which the color detail is comparatively grossly rendered. The reason of this is twofold; first, the picture generally occupies a smaller visual angle and is nearer than the original, both of which conditions will reduce the quantity of light falling on it and consequently that reflected from it; and second, there will be more light absorbed by such a physically correct picture than will be absorbed by a colored pigment picture provided the pigments themselves are correct and are properly handled.

The second method can scarcely be said to have a practical existence. The several announcements of success attained in that direction made within the past few months have at best been only partially correct. Indeed the conditions imposed seem almost beyond the possible; for inanimate matter is called upon to act in a manner requiring little short of intelligence.

A lucid explanation of the third process must begin with a fair knowledge of the nature of color vision, and this can be treated of best by referring to the spectrum. It is scarcely necessary here to recall the fact that ordinary white light is composed of an infinite variety of wave lengths (in the physical sense) or, if we choose, an infinite variety of colors (in the physiological sense), and that the color of an object results from the kind and number of these components of white light which it does not absorb, and consequently reflects or transmits. This fact once recognized, it is evident that to be able to deal properly with the spectrum, which is nothing more or less than an orderly analysis of white light, is to be able to deal properly with all color under all conditions. The careful and elaborate investigations of Koenig, Helmholtz, Abney and others, have firmly established the tri-chromatic theory of color vision first propounded by Thomas Young. According to this theory the eye interprets to the mind a physical condition) not by handling the external color reality (regarded as each and every hue and tint and shade by itself, but by receiving and perceiving, grouped into three more or less distinct classes, all the endless variety of color presented to it. In other words, the perception of color is realized by an analysis and a subsequent synthesis of the light producing the sensation. This leads up to this first principal employed in this method of color photography, viz. ; a photographic analysis of light corresponding to that accomplished by the eye, so that when this analysis is properly presented to the eye, it has only to affect the synthesis, and thereby present to the mind what is virtually the same as the original in the physiological sense.

In order to show more definitely the nature of this physiological analysis and synthesis, let Fig. 1 represent a spectrum with the red end at the left and running through to violet at the right; the large capitals being the initials and approximately representing the position of the colors as popularly designated; the small capitals indicate Frauenhofer's lines, while the black bands marked with the small letters, "r," "g" and "v," represent narrow zones of the spectrum with location and color as shown in the figure.

Now it is found that if from a given spectrum quantities of "r," "g" and "v" light be taken (the amounts being proportional to the ordinates X, Y, Z, Fig. 2) and distributed upon a white surface as indicated by the height and range of the three curves in Fig. 2, the result

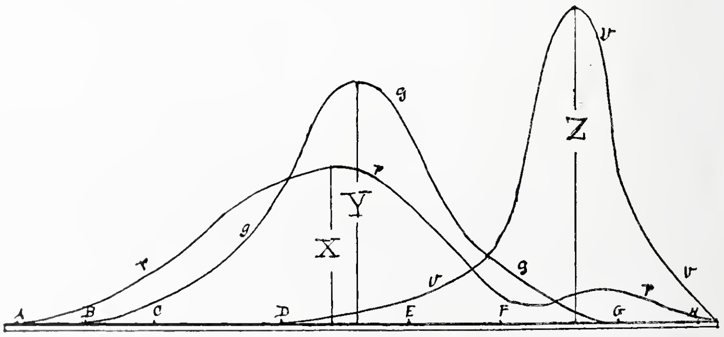


Fig. 2.

is, so far as the eye is concerned, a perfect representation of the spectrum. The ordinates of the curves show the distribution of intensity, while the bases indicate the latitude of each of the colors. It must not be supposed that the violet is the brightest because its curve is high; for in fact it is the least luminous, and a relatively large amount is required to produce even its proper low luminosity.

The curves in Fig. 3 show the relative luminosity of these three fundamental sensations, so called; the heavy curve indicating the relative luminosity of the spectrum as a whole. If then the kind and quantity and distribution of light is known, which is requisite to faithfully represent to the mind through the eye all the external color quality, it only remains to obtain photographically this particular analysis of light. This is secured by obtaining in three several negatives (Ives) or in the three several linear areas of one linear structure negative (Joly), taken of the spectrum, deposits of silver, the degree of density and range of which correspond (closely) to the curves in Fig. 2. From these negatives positives are made, in which, of course, the degree and range of transparency correspond to the curves. If these positives are backed with material transparent to "r," "g" and "v" color respectively, and light is projected through them so that the colors are properly superposed (Ives), or juxtaposed (Joly), the analysis is completed, and the eye has only to perform the act of synthesis.

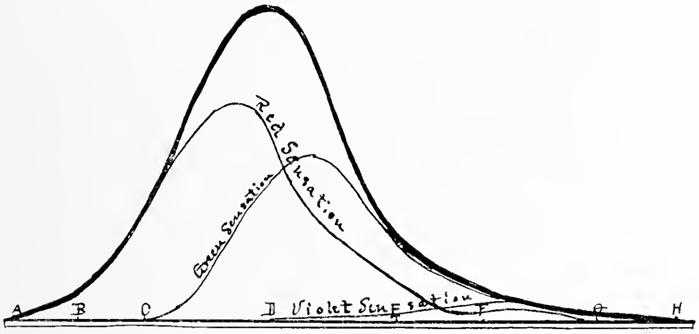


Fig. 3.

The equivalence of juxtaposition and superposition, under certain conditions, is very interesting and important. It is a well known fact that the superposition of red and green light is recognized as yellow by the eye, and that similar results occur with other superpositions. The reason for this is quite apparent after little study in Fig. 2 of the synthesized spectrum. Now the juxtaposing of the same colors will give the same derivatives providing the juxtaposition is properly made. In the Joly process this is accomplished by placing the colors in very narrow bands side by side.

It has been demonstrated that when the three fundamental colors, taken all together, or by twos, or singly, in various proportions, are juxtaposed and presented to the eye so that the combination occupies a visual angle of not more than one or two minutes of arc, that the colors are composed and the complex color sensation produced is the same as that resulting from superposition.

There seems to be a definite limit to the fineness of structure of the retina, at least so far as color vision is concerned. The term Retinal Unit has been suggested for this small area within which color vision is homogeneous; and since the visual angle becomes practically an inscribed angle within the eye, the diameter of the Retinal Unit cannot exceed two or three minutes of arc.

A simple computation based on this fact will show that for a transparency viewed at a convenient distance, some two hundred and fifty or more lines per inch will be required in order to synthesize the color perfectly.

In showing such a picture with the lantern it is evident that these conditions with reference to the visual angle must be observed.

The question is often asked why the colors of the screens, by which the photographic analysis is effected, *i. e.*, the taking screen colors, are different from the fundamental colors employed in the final synthesis? A glance at Fig. 2 will explain this. Examining the curve "r," for instance, it is evident that the part of the spectrum engaged in producing the silver deposit in accordance with the curve is far more than the narrow zone "r," of Fig. 1. It is in fact such a part and amount of the spectrum that, taken as a whole, it appears decidedly orange to the eye. The same explanation applies to the other taking-screen colors.

Concerning this method as applied in the Joly process it must be acknowledged that it has thus far proved the most practical, that it is based upon strictly scientific principles, and that the results are very satisfactory.

The picture obtained is in the form of a transparency and consequently the degree of luminosity is wholly under control. All the apparatus and operations are exceedingly simple.

The essential articles other than are found in every plate camera, are a "taking" and a "viewing" screen, an orthochromatic screen, which renders the sensitive plate to be used panchromatic, that is equally sensitive to all color, and a contrivance, usually in the form of a simply constructed plate-holder, to press the taking screen firmly against the sensitive plate during the exposure. The taking and viewing screens are gelatine-coated, glass plates, finely ruled in three several colors, those of the taking screen varying slightly from those of the viewing screen, which are red, green, and violet.

The photographer in taking a picture exposes, develops, and makes the positive as usual, but instead of mounting it with a plain cover glass, he superposes the viewing screen upon it so that the three several colors upon the viewing screen fall upon the lines on the positive in a certain order corresponding to the order in which these have been derived from the taking-screen. Figures 4 and 5 show a negative and positive of the American Flag. They are strictly orthochromatic, besides having the qualities for a color photograph, and show in what respects a Joly negative and positive vary from the usual negative and positive.

The linear structure is inherent in the nature of the process, but there are very definite limitations, as already shown, under which it is admitted, and these conditions must be carefully regarded. If, however, the photographic manipulations are rightly conducted, and the viewing conditions properly arranged, the conspicuousness of the lines almost if not entirely disappears.

AUTOBIOGRAPHICAL SKETCHES.

CHAPTER VII.

BY H. P. ROBINSON.

> "Every man is the son of his own work."
>
> DON QUIXOTE.

1862 was the year of the Second Great International Exhibition. Photography was not well treated, but was stuck up in a damp tower, that called for much enthusiasm to visit. I was one of the committee for receiving the awards, represented in the initial of this chapter, and that is all need be said about it, except that the other members represented are T. R. Williams, Dr. Diamond, Henry White, Thurston Thompson, and Roger Fenton. It was also the year of my "Bringing Home the May," which I have always regarded as my most ambitious effort, but perhaps not my best picture

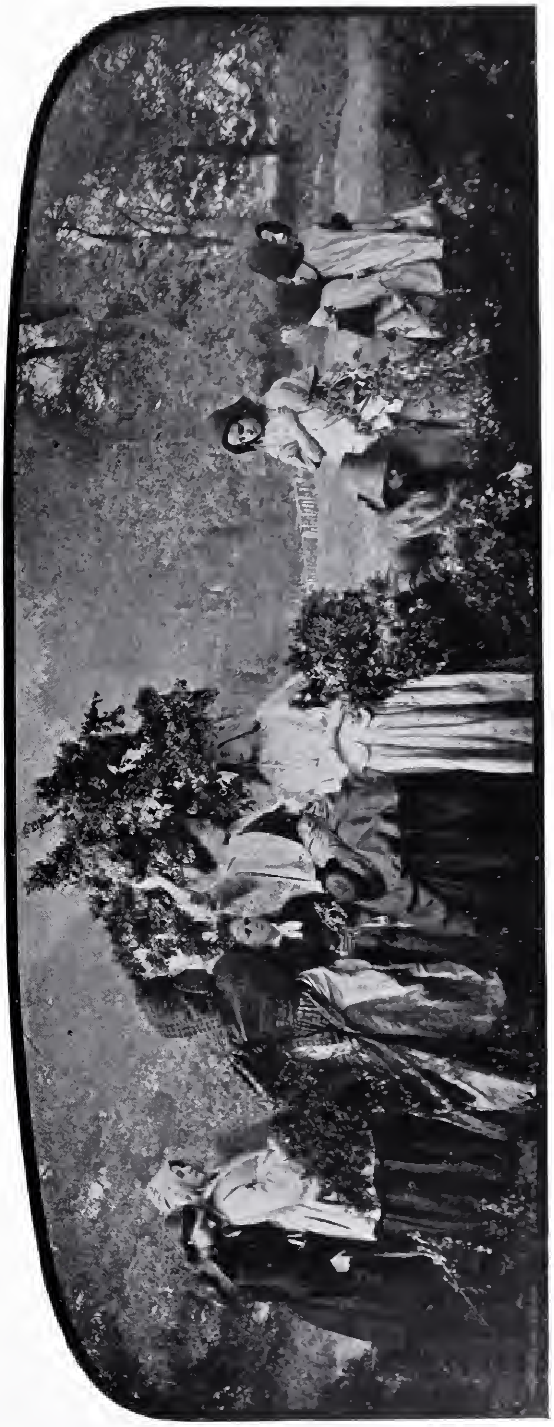
This picture was a greater undertaking than I had hitherto attempted. The size was 40 inches by 15 inches, the largest camera I possessed, 15 by 12, made of deal by a jobbing carpenter; the exposures about fifty times longer than they would be now, the white flowers, of the May, of which great quantities were used, are well known to be very shaky in the wind, and the weather during the season of blossoming of the May very doubtful; above all it was difficult to snatch time for its execution from the ordinary business of portraiture. Possibly it may be of interest to the photographer of today to know how an elaborate picture was produced over thirty years ago, without the conveniences of modern times. It would be a simple matter now. To describe it to be properly understood, I shall be obliged to reproduce the picture. It will be found on the opposite page.

The first thing to do in designing a picture in any material is to make up your mind what you are going to do. If you can see your picture before you in your mind's eye all the better. In the present instance the origin of the picture was this: At an old book stall I had bought a rare edition of Spenser's Poems, and opened it for the first time at "May" in the Shepheard's Calendar, and the quaint lines brought up the picture before me almost as plainly as if it had been already photographed. It was all the more visible to one who had been out on old May-day with parties who kept up the old custom of bringing home the May.

"Is not thilke the mery moneth of May,
When love-lads masken in fresh aray?
* * * when all is ycladde
With pleasaunce: the ground with grasse, the woods
With greene leaves, the bushes with blooming buds.
Youngthes folke now flocken in everywhere,
To gather May-buskets and smelling brere:
And home they hasten the postes to dight,
And all the kirk-pillours are day-light.
With hawthorne buds, and sweet eglantine,
And girlonds of roses, and soppes in wine."

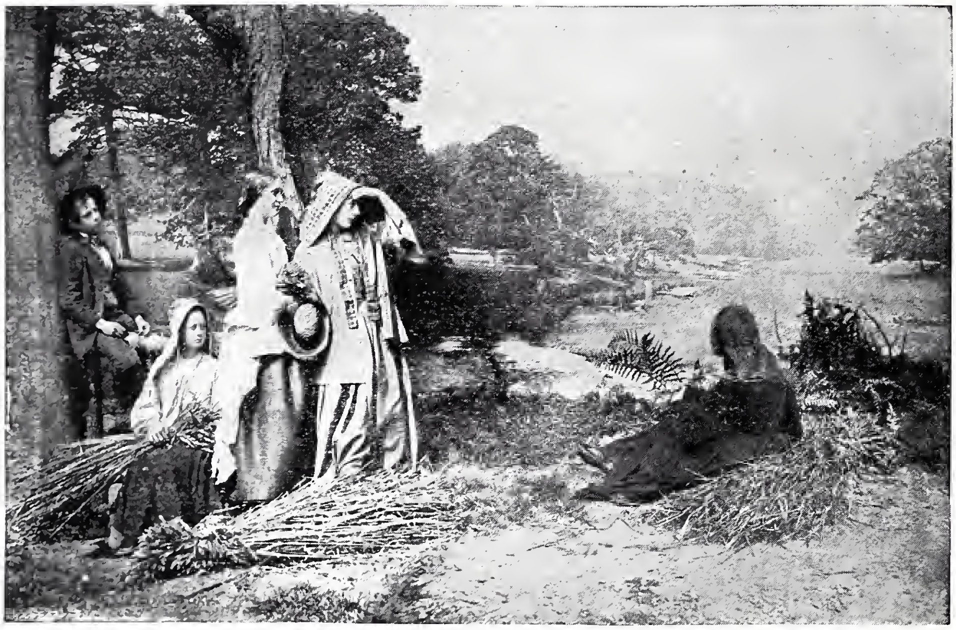
Is not that beautiful! It was in the winter; sketches were at once commenced, and a full-sized drawing made. I greatly regret that I only recently destroyed a quantity of these preliminary drawings, or I should have liked to make an illustration of one. It requires consideration to decide how much should go on a plate, and where would be the best places for the joins; these have all to be marked on a full-sized sketch; then the models, costumes, and accessories have to be selected and prepared; and minute directions written on the sketch so that the photographer should have as little to think of as possible when the important moment arrive. During the wet days the trouble and difficulty were much greater than they would be now. There was the waiting for the preparation of each plate, for a wet plate would not keep good for more than a few minutes, giving short grace for arranging the poses, some of which were extremely difficult; the exposure of each plate was about fifty seconds, making the stability of the figures anything but certain, and a slight movement of white flowers is usually very conspicuous. In the case of the two central figures, one of which has a bundle of May on her head, besides the use of several rests of the usual kind, quite a formidable wooden scaffolding was built behind them. Another great hindrance, making the whole thing very doubtful indeed, was the weather. The negatives, naturally, could only be made when the May was in blossoms, and it does not last above a fortnight. It was decided that the effect should be that of pale misty morning sunshine. I could easily manage for the figures without the mist, but I was bound to have sunlight. For nine consecutive evenings a pony carriage load of May was gathered in the Warwickshire lanes and brought into the house, and the next morning was cloudy, but on the tenth morning several of the negatives were successfully taken; the three next days were dull, and on the fourth the others were accomplished, but with rather faded samples of May.

One of the incidental difficulties may be mentioned. The selected model for the back figure, although she had had some practice, got nervous, and could not stand still. There was no time to select and train another, and the principal figure was quickly dressed in her clothes and performed the part. That there are two figures from one model has never been detected, and this is the first time it has been mentioned.



BRINGING HOME THE MAY

Fitting the negatives together was a delight for odd times, but the printing was very difficult. I did not then, as I have done since, fit the negatives with register marks so that anybody might print them. Each negative was fitted separately for each print, the paper being moved to its place by the aid of pins run through the print at known points. The paper had to be specially made, as there was none on the market of that size. Thinking I should only want a very few I did not have a printing-frame made of the size, but used a 24 by 18, and rolled up the paper at each end in black velvet, while the other part printed; each complete print took several days' exposure, and some were spoilt by time. It took a good deal of enthusiasm to carry this picture to anything like a successful end, and there is now, I believe, only one moderately good copy existing, that in my own possession. There is a very faded print at the Camera Club, and its ruined condition rises in judgment against me every time I see it. It was engraved in the *Illustrated London News*, and a small copy was presented to every member of The Photographic Society.



AUTUMN

Meanwhile the mill was always rolling, and Cartes and other pictures were being turned out in quantities. It was about this time that I found it was absolutely necessary to have larger premises. Fortunately the occupier of the house adjoining mine, and twice the size, wanted to get rid of it, and I secured it, built a model studio, not quite so gorgeous perhaps as is now the rule, but very fine for those days, and at the bottom of the garden, which opened to a back street, was a most convenient printing house and storage for negatives, which now had accumulated largely. There was also a stable, and every accommodation for photographing horses. This brought 1862 to a contented end, except that the work was beginning to affect my health. This year also I was elected a member of the Council of the Photographic Society, on which I continued for just thirty years.

In 1863 there was an abatement of the demand for Cartes de Visite, and an increase in high priced colored pictures; and the receipt of medals for exhibited pictures were as numerous as the conditions of exhibitions allowed; they were still honorable distinctions.

The picture of this year was "Autumn," 24 x 17, of which I give an illustration, and need say nothing of its production, but may perhaps give a line or two to its reception by the photographers and the public.

There was much more written about this picture than any of the others, but the following extract from a long notice in the Journal of the Photographic Society perhaps epitomizes best how opinions stood:

" Mr. Robinson's motto is Excelsior. He has resolved and we think succeeded in his resolve, to produce a picture every year which shall by the exhibition of some new phase of artistic power, better vindicate the capacity of his art, for all those purposes of pictorial representation which consists of the faithful rendering of natural beauty, and make good its claim to a place in the sisterhood of the fine Arts. The enterprise is a bold one; and to succeed in it the young artist has had to lay to heart the lesson taught by one of the most eloquent of modern statesmen, who, in replying to the derisive uproar by which "The House" silenced his first attempt at parliamentary oratory, exclaimed "the time will come when you *shall* hear me." Mr. Robinson's first attempt met with but scant encouragement. Painters cried, pooh, pooh! Photographers muttered comments on traveling out of the legitimate sphere; and hybrid critics talked the cant of art and denounced "patch work." Mr. Robinson, however, believed in his art, understood his capabilities, and had faith in the result of his own honest effort to realize them. He brought to bear the experiences of much art study, the careful art training of a painter; and we believe that he has now convinced a large majority of the most incredulous, that the photographer who knows what he is about can, by the use of several negatives, produce a a harmonious composition such as had not been conceived possible in the wildest dreams of the less instructed in the science of the sunbeam."

Several smaller pictures, as usual, were done this year for exhibition. One particularly, a carte called "Little Sunshine," was very popular, and was made a presentation print of several societies. There were no features worth mentioning during the rest of this year, or part of the next, until it began to be quite clear that the work was getting too much for me. Overwork, and I believe the constant breathing of the fumes of collodion had induced a nervous condition. I had had no holiday except an occasional day or two in London, for six years. I now tried several holidays, but they failed to pull me together, therefore in October I sold the business which had supplied me with such varied emotions from almost complete failure up to success beyond the hopes of a lively imagination, but not so rich as in the friends I had made in the art I loved, and the town of my adoption. I retired from business in October, 1864, at the age of 34, went to live near to my friend, G. Wharton Simpson, in London, helped him with the *Photographic News* for a few years as a recreation, and then as my health improved I felt a restless desire for something more to do, therefore taking Mr. Nelson K. Cherrill for a partner, we built a studio in 1868 in Tunbridge Wells, which prospered, and which I continued to carry on after Mr. Cherrill left me in 1876 until I gave up altogether in 1888, finding myself then as I did before, too young to retire, but quite ready to enjoy the ease that belongs to a more advanced stage in life.

The history of photography as it has come under my observation since I left Leamington in 1864 would, I think, be found full of interest, especially that part relating to the invention depending on gelatine, such as the carbon and Woodburytype processes; dry plates and alkaline development; and there could possibly be something readable made of a History of the Societies; but so many names of persons still living would have to be omitted, that it may, perhaps, better be deferred for awhile, and my narrative ended here.

It is possible that the superficial reader will attribute my success solely to the carte de visite mania, and think me exceedingly lucky in falling upon good times, which is true. There is no doubt that I have much to thank the carte de visite for, but I attribute my success to some extent to being ready to turn fortune to account, when fortune came. If I remember rightly all photographers did not succeed even in the good times, and I cannot help pointing out that as a rule those succeeded best who had been brought up to use artistic faculties: and those least who were simply scientists. And I say this, well knowing that our greatest artist, Rejlander, had little worldly success, but he was singularly wanting in business capabilities; he dreamed of art instead of trying to make money as well as pleasure by it, and as I have often acknowledged, professional photography is not all art and poetry. The Syren must not always sing, or the mariner gets no chance.

At the request of a number of our subscribers who reside at some distance from New York, and who consider the time limit given too short, and also for the reason that the number of entries sent in was much smaller than we had anticipated, the time for sending in pictures for our competitions has been extended to the 15th day of March. The winners of the medals will be announced in the following issue.

PALESTINE PHOTOGRAPHICALLY CONSIDERED (*In Brief*).

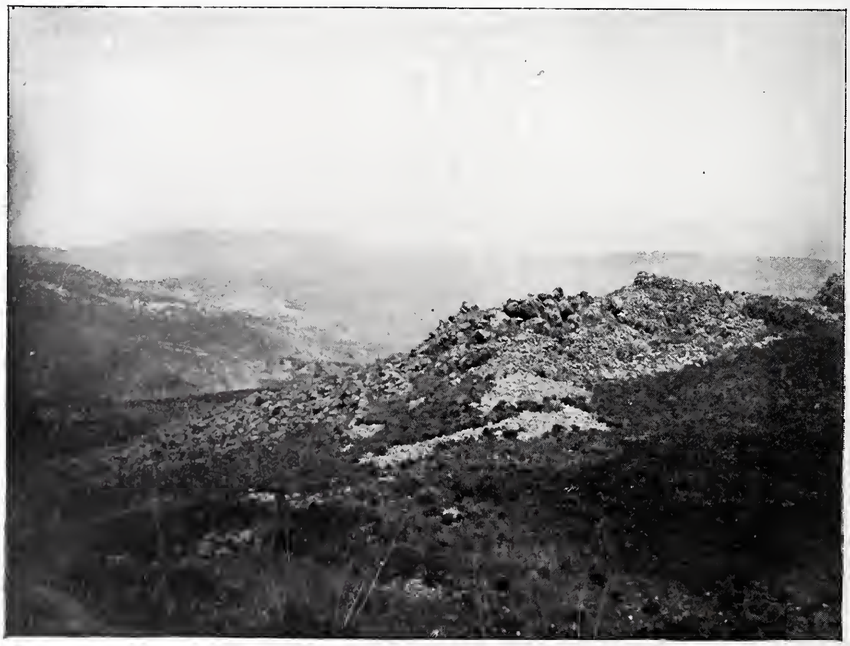
BY ROBERT E. M. BAIN.

The portion of Palestine known to tourists and travelers is bounded on the south by Bethlehem and on the north by Damascus, the air line distance being about 135 miles. By known, I mean the portion most traveled by parties, under escort. This portion of Syrian territory comprises all that is most famous in sacred history—the Mecca of Bible students. Every year large parties of tourists and teachers of sacred history traverse this part of the land, under the escort of special dragomans and attendants, and the trip is of but little more trouble than a fishing excursion to some local resort. Everything is provided—tents, beds, chairs, tables, lights, meals and animals. The trip is intensely interesting except from a photographic standpoint, for the country is of the "dead and buried" description, and there is but little to attract the camerist outside of the cities, and they are few and far between.

Pictorially considered, there is less of interest in this place than in most any other portion of the globe, the desert excepted, for under the present rule every class of labor is discouraged by over-taxation, and the result is not only complete stagnation in husbandry and building, but the demolishment of the work of previous generations, the materials being used to cover the shiftless population, in the form of hovels, and the wood for heating purposes.

Almost the entire country is a dearth of everything save a few stunted olive trees and a grand chaos of stones and sand. For miles the eye catches a bare and dreary wilderness—no houses, monuments, trees or land under cultivation, and yet this soil can be made to bear every kind of fruit and grain. It is the despair of the "button-pusher," and even the more expert camerist is lost for subjects to aid in making the views attractive. The efforts of the man with a box of films are quite limited to views in Jerusalem, Nazareth and Damascus, while even to an experienced photographer the picturing of this land of sacred association is a trial, for the fact that some important personage passed over a certain road lends but little charm to a view, uninteresting otherwise.

It is very difficult to secure figures to liven up a scene, as the native is opposed to being photographed, seeing something diabolical in the appearance of the camera, with its cannon of brass and glass projecting from its front. As an example of the class of view that is offered by the historical places, permit me to show a view of the Horns of Hattin, near Tiberias. This speaks for itself—a picture of a small hill covered with rocks. The fact that this is the Mount of Beatitudes will commend it to Bible students, but to a view-finder it falls short of anything to attract interest. As it was, I rode for a mile or more around this spot to endeavor to make an attractive photograph, and this was its accomplishment. At Dothan we covered several miles of territory before coming upon a small flock of goats to help lend interest to the place of Joseph, of the "Coat of Many Colors" fame. It was the same at Shiloh; again at the plains of Jezreel, the Waters of Merom, and, in fact, generally throughout the entire stretch of country. From an historical point of view, the places were intensely interesting, as the dragoman was well posted on Bible history, and he lectured as he went on, thus putting a rose color



Copyright, 1894, by R. E. M. Bain.

HORNS OF HATTIN, NEAR TIBERIUS, SEA OF GALILEE, SYRIA BY R. E. M. BAIN of romance upon what was to the eye a desert.

In the cities there are shops and street scenesthat give life to the picture, and the camels, donkeys and natives, in their quaint dress, lend themselves toward making the scene typical of Oriental life.

The houses are for the most part devoid of pictorial possibilities, as they are of the "salt cellar" variety, with a door and no windows, and except that one occasionally finds a stray donkey or goat browsing on the house top and wonders how they got there and how they are removed, are of no interest.

So far as the generality of subjects in the cities are concerned, they consist of buildings "with a history," and these have been and are photographed to death, to use a very descriptive phrase; and as the places change not at all architecturally, one can buy all there is to picture at the shops, in the form of underprinted and yellow reproductions of native "artists."

To briefly describe some of the famous places, I may say that Jacob's well is a small hole, guarded by a native, without an attractive feature, unless it be the broken-up evidences of some former architectural work, the remains giving no evidence of what that might have been. Bethel is a hill of very small dimensions, without any incumbrance, and the site of the famous Palace of Ahab consists of a small plateau, with some fallen pillars of the time of Herod, half buried in the soil. Cæsarea Philippi is a small village now called Banias, its sole attraction being a fall of water, a portion of the Jordan. Above this place are the remains of what was once a very large and attractive castle, but now a ruin without pictorial attraction. With but little care it could have been preserved and made a grand ruin, but it is, as you see from the illustration, a very large dirt heap, with a few remains of walls half buried.

Copyright, 1894, by R. E. M. Bain.

JACOB'S WELL, JERUSALEM, PALESTINE BY R. E. M. BAIN

Copyright, 1894, by R. E. M. Bain.

POOLS OF SOLOMON, BETHLEHEM, PALESTINE BY R. E. M. BAIN

The sole exception to the general barrenness is the town of Tiberias, on the Sea of Galilee, an ancient, walled place of about a thousand inhabitants.

The ancient walls are in a delightful state of dilapidation, caused, it is said, by earthquake. The streets, fishermen, boats, hotel, and mosque are all

Copyright, 1894, by R. E. M. Bain.

CASTLE OF CÆSAREA PHILIPPI, SYRIA BY R. E. M. BAIN

quaint and oriental, and the waving palms and nets hung to dry on the towers in the sea add a picturesqueness not to be found elsewhere.

If those who rule the country would take some interest in keeping up its institutions, repairing its roads and bridges and making its ruins attractive, instead of being weed-overgrown, there would be a greater influx of artists, photographers and tourists than at the present time. As an example, I may mention in particular a finely-built bridge of stone (a large arch and of a most artistic and stable construction) erected by the Romans at Banias, crossing the rapids of the Jordan river, that is about decayed for want of a small amount of repair, and it was stated by the dragoman it has been reported time and again, but without result. It is the only means of reaching the plain from the place mentioned, and at the present rate of decay it will be a wreck in a very short time, and if required to be replaced will cost some thousands of dollars. This makes the travel hard and the picturing is not improved in proportion.

To come to Damascus. It is the city par excellence for the man with the hand camera, as well as the fellow with the larger outfit.

Days can be profitably spent in the native quarter, which is of kaleidoscopic nature and much more oriental than either Constantinople or Smyrna. It is the headquarters of the caravans which trade in the interior of Persia, and long lines of camels may be seen at least twice a week, slowly plodding with their heavy loads into the silk quarter or bazaar, where they are unloaded in the large warehouses and the goods sorted for either re-shipment or sale.

Camera work in this city is not so easy of accomplishment in some respects, as in other places, owing to the fanatical feeling of the natives, and to the fact that the principal bazaars are roofed in, that is, the entire street is under cover, both roadway and building, so that it is impossible to picture these things for want of light, but in the saddler's bazaar the places where ancient arms and curiosities are sold, such is not, or was not the case, and the constant haggling that goes on with all classes of sales makes attractive the pictures taken in these narrow streets. At the street of the dyers, each house occupied by this class of merchants, is hung for more than fifty feet above the street with cloth drying after the dip, the street having the appearance of an immense dry goods store, roofless, with the goods on racks for display. The dyer himself is a curiosity, as he is invariably stained with the dye he has been using, both arms and face.

The bazaar of scribes has innumerable booths with the occupant sitting crossed-legged in the window waiting for customers, the paraphernalia of his trade spread out before him ready for use.

The schools are always a source of interest, with the pupils all rocking back and forth reciting their lessons in a dull monotone, and the teacher seated in Turkish fashion sharply calling them to order when they, like children in more enlightened schools, take to cutting up and playing pranks on one another. All of these things can be reproduced with more or less success, depending on the camerist. Certainly no more interesting pictures can be produced than come from this land of ancient history.

The surroundings of this city are also of great picturing possibilities, for the Abana river runs through the Anti-Lebanon mountains, and

Copyright, 1894, by R. E. M. Bain.

MILITARY ROAD, DAMASCUS BY R. E. M. BAIN

roars over rocks or tumbles down over rocky precipices making as wild scenery as could be desired.

The mountains too are of the most rugged description, and the scenery from the stage coach is on the order of our own Rocky Mountains, except that they are not on so grand a scale. From Damascus to Beyrout is a journey of about 14 hours by stage, for most part through the mountains, and at the changing places one finds the Zouave guards in their picturesque uniform. By long and bloody experience the inhabitants of this territory (for most part French settlers) have found that to trust in the officials of the general government is to lean on a very weak straw, and hence by some special arrangement made with the French government, the settlers have their own guard.

Beyrout is another picturesque place, with rugged shore and mountainous background. Large numbers of vessels of various nationalities enter the harbor almost daily, and numbers of yachts and private craft of other kinds are always to be found at anchor off the port. The native quarter, though small, is similar to that of Damascus, and much camera work can be done here with satisfaction. The sunsets on the Mediterranean are noted, and with the adjunct of the rocky coast make very interesting pictures. It is a great regret that color photography is not a fact, for much of the beauty of such pictures is lost for want of the life that color gives. The silk-worm industry is well in hand here, and pictures of the mulberry fields and silk-worm houses, with other interesting features of that business, will increase further the list of views. Of course the number of negatives will depend on the taste of the photographer, but there is in the two cities mentioned, enough of subject matter to fill a large album with most attractive pictures.

In conclusion, I would not advise the amateur, touring through this country, to leave his camera at home, but offer the foregoing to warn him against "great expectations," and to give a hint where the most and best pictures are to be obtained. A camera in the interior is a burden without sufficient recompense, but in the larger cities, it is a most useful assistant in recording the sights and scenes of the trip.

A NEW SYSTEM OF FLASH-LIGHT PHOTOGRAPHY. BY LYMAN G. BIGELOW.

Having seen so much work by flash-light photography of inferior quality has suggested to me that an article for The Times on this subject would be appropriate at this time.

The method I employ I have named "the Duplex System," and the success attained by its use may be estimated by the illustrations accompanying this article.

The lights employed are two in number, hence the title "duplex," and are very small and compact. The lamps are connected to the shutter bulb of the camera by a branch tubing. Pressure on the bulb opens the shutter and operates the flashing of the two lamps simultaneously.

The success of this method depends upon securing the correct location of the lamps. Lamp No. 1, which is used for the main or principal light, should be located at the point which will cause the light to illuminate the subject from the proper angle; the other lamp, No. 2, should always be placed as near the camera as possible. In my own practice I place No. 2 directly behind the camera, sufficiently elevated, of course, that the camera will not interfere with the illumination of the subject.

It will readily be seen that by placing No. 2 in this location, the illumination of any shadow which can possibly appear in the picture will be secured. This location also insures that the shadow illumination shall intimately join with the main light and secure good relief. It is also evident that no reflecting screens are necessary when operating this system; a manifest advantage, surely, when sittings are required away from the studio.

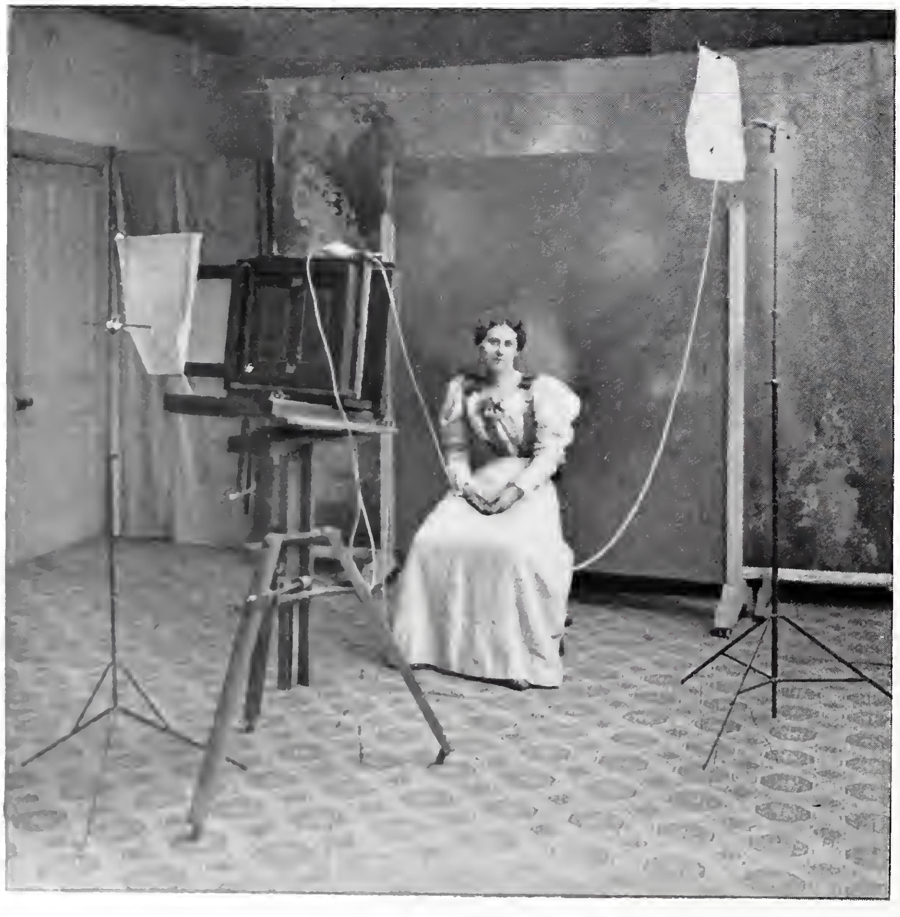
I think the illustrations will convince the reader that as fine lighting may be secured by use of the flash-light, as can be produced in any other way. For emergency orders and large work it has the field entirely to itself, while as a studio adjunct it is of superlative value.

An important factor in securing fine results with the flash-light is the lens. I have tried nearly everything in the market and was never completely satisfied until I secured a double anastigmat from the works of the Manhattan Optical Co. of New York. Its advantages are: first, plenty of illumination for securing a correct focus at night; secondly, when objects which may be out of focus are shown, there is no apparent doubling of the defining lines, merely a pleasing softening of definition which is very artistic; third, when stopped down closely there is no wiriness of image usually seen under like circumstances.

The style of the lamps is of no importance so long as they are made large enough to burn from 10 to 200 grains of flash powder and be capable of being operated simultaneously by the bulb as described.

I have in my experiments used three differently constructed lamps, all of home manufacture, which worked equally well, though, one being more convenient, the others were abandoned. Most any person of mechanical ingenuity can construct or cause the construction of a lamp to answer the purpose.

By referring to the general view of the studio the method of operating the duplex system will be understood.



GENERAL VIEW OF STUDIO

The relative positions of camera, sitter and lamps, are the same as when the illustration marked No. 2 was taken.

The stand upon which is placed lamp No. 1, is composed of a light folding tripod, in the center tube of which are inserted three sections of brass tubing, each section about forty inches long. The smaller section is made to slide inside the next longer section, &c. A thumb-screw holds each section in place after adjustment. A stand of this construction weighing about three pounds, lamp included, allows the lamp to be elevated to fifteen feet.

The extreme height is often required when groups are being taken in large rooms. Success in this work is not difficult after a few experimental trials to find the power of light suited

FLASH LIGHT PORTRAIT BY S. G. BIGELOW

to the lens and plate used, using of course a definite charge of powder to be increased or diminished as the result warrants. After these data are once known each plate can be counted on beforehand as sure for a good negative.

In my practice for a cabinet bust, diaphragm *f*31, I use a small mustard spoon full of "Blitz" on each lamp. Naturally, you will say. "Where does the shadow come in if both lamps are charged the same?" Of course, each lamp is of equal illuminating power if at the same distance from the subject, but the shadow light passes through a cloth screen, besides being usually double the distance away from the subject.

For portrait work each lamp is fitted with a screen of fine thin cloth known to the dry goods dealers as "silkaline." Saturate this cloth with a solution of silicate of soda 4 oz., water 2 oz., and add enough of a saturated solution of bichromate of potash to make the solution a canary yellow. Dry stretched.

By this method not more than one fourth of the amount of powder required by other methods is required. By increasing the charge on lamp No. 1 the contrast of the lighting is increased. The lighting is under as perfect control as if working in a perfectly equipped modern studio.

THE PERFORATIONS. BY C. FRANCIS JENKINS.

OF the holes, which have been spoken of as being punched along each edge of the film in order to automatically register the pictures, there are three general shapes, *i.e.*, a round hole; a round-cornered rectangular, or oblong hole, and a perfectly square-cornered rectangular hole. The round hole is most generally used on machines employing hooks or prongs to feed the film, and very rarely on machines with sprockets, as sprockets to fit such a film would have to be drilled for each tooth, the teeth being driven into the drilled holes after having been smoothly pointed. The round-cornered hole was doubtless adopted by its advocates under the impression, quite generally entertained by mechanical engineers, that square-cornered perforator teeth cannot economically be kept sharp. This has been proven entirely false, at least so far as the perforating of film goes. The punch teeth of the perforators built for the two largest manufacturers of film, after perforating thousands of feet of film stock, and there are 128 perforations to each foot of film, were in as good condition as when first set up. This supposed difficulty is not, however, sufficient to condemn the square-cornered hole, even though it should thereby upset mechanical traditions. Sprockets are cut by turning down, in a lathe, the face of the brass cylinder so as to leave two little conical ridges, the proper distance apart, upon its circumference. The cylinder is now put into a gear cutting machine where the ridges are cut away in part so as to leave tits or teeth, the shape or "pitch" being determined by the diameter of the sprocket. This process produces a tooth of rectangular base section. Now the tooth, in intermittently feeding the film forward in the lantern, as it does, by little jerks, takes the strain, not upon its advancing face, as it should, but upon the corners, as shown in Fig. 1, enlarged eight diameters. The error of such a method soon begins to manifest itself by little irregular, white lines in the forward or attacked corners. Upon examination these little irregular lines are found to be minute ruptures which continue to get worse until finally the holes are torn entirely to the edge of the film, and while the picture surface is still in good condition the film must be thrown away because it will not go through the projecting machine without parting too frequently. If the corners of the sprocket teeth are rounded so as to more nearly coincide with the shape of the holes, it must done entirely by hand, and that, too, corner by corner of each tooth, for a burring tool will give a circular of 90 degs. only on a square, not, a rectangular cross section tooth, and the film would, therefore, fit little better than before. Neither could it be made to continue to fit the face of the corrected tooth for the film is constantly changing with changes in the temperature and humidity of the atmosphere. This expensive process would not, therefore, be of any lasting benefit, while, if the trouble were eliminated at the start by perforating true rectangular holes, holes which would keep their shape, and approximate the natural base cross section of the tooth, the object sought would be accomplished in the easiest and most natural way. Neither would the changes of temperature or humidity effect the feet or fit. A glance at Fig. 2 shows the reason for this. It will be seen that the face of the tooth comes squarely against the edge of the hole which receives the entire strain. Films so perforated do, as one would naturally suppose, in actual practice, generally outlast the film having perforations of the other shape. And it is to be hoped that the rectangular hole will be more generally adopted by manufacturers of film stock and of picture ribbons, which would introduce a saving to the poor exhibitor whose trials and vexations are legion.

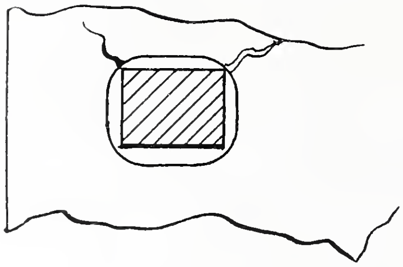


FIG. I.

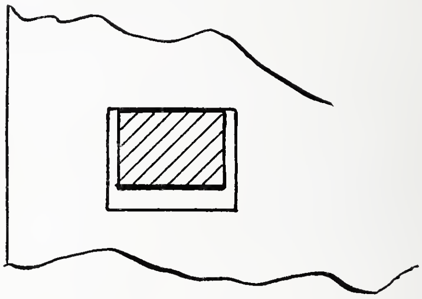
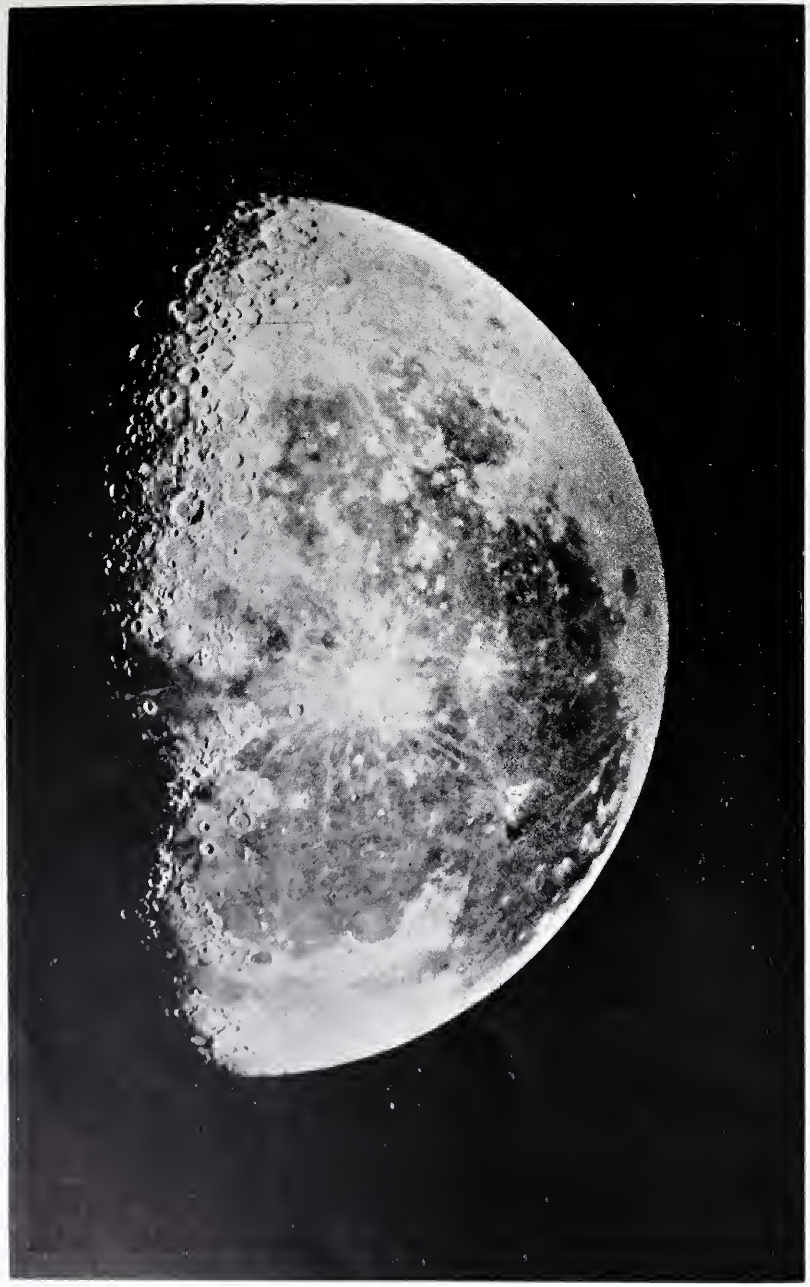


FIG. 2.

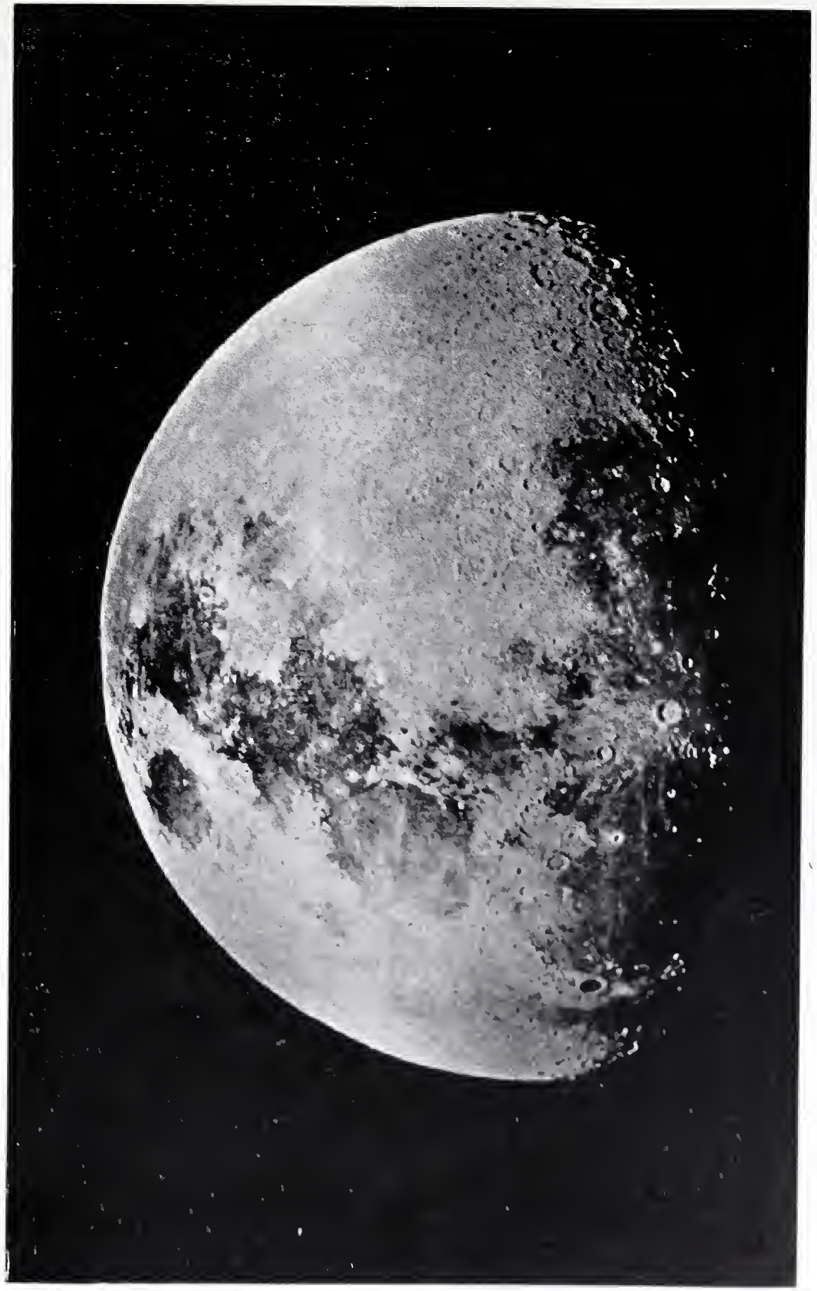
From Photograms of '97.

WILLOW WARBLERS BY CHAS REID



LAST QUARTER

L. M. RUTHERFORD, PHOTO ENLARGED BY A. BROTHERS, MANCHESTER



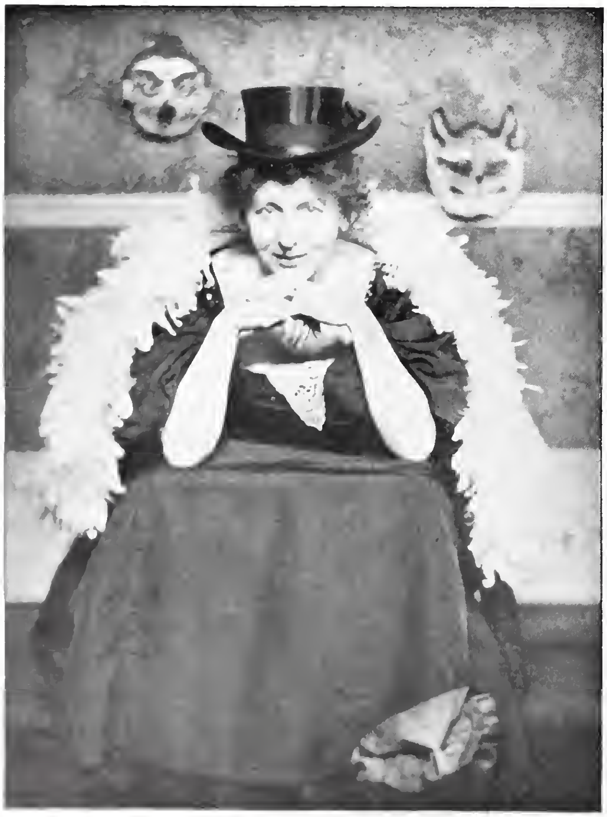
FIRST QUARTER

L. M. RUTHERFORD, PHOTO ENLARGED BY A. BROTHERS, MANCHESTER

THE PHOTOGRAPH AND THE PAINTING. BY CLEMENT HOPKINS.

Artistic photography has received much hostile criticism, in part rightly, but for the greater part wrongly. In last year's (1897) *British Journal* there was an article—anonymous—presumably from a backsliding photographer, which asserted that artistic photography was a fraud, and deduced as his chief proof that many were deserting its ranks. Many have deserted, but they are the weak-kneed, the unstable, and photography as an art will take no harm thereby. Photography asks from them too much patience, too much perseverance, too much knowledge, too much indifference to disappointment. It is, in fact, too difficult for them.

The painters and draughtsmen have been the chief detractors of photography as an art. We should feel more disposed to listen to them could they but establish the facts that painters were always the best critics of their own art, and that jealousy was not a factor in their motive. It is a noteworthy fact that the painters will not allow to the photographers the same defense that they adopt themselves. When a picture is unfavorably criticized it is not unusual for the painter to defend it on the ground that the critic is unskilled in the handling of paints and brushes, and to point out the technical excellences that have been achieved. The photographer is never permitted to plead the technical difficulties that have been overcome.



"ENTRE NOUS" BY CLEMENT HOPKINS

Perhaps this is as well. Excuses are after all only excuses, and an art should require no apologist.

Mr. Joseph Pennell speaks of the "dull camera" in contrast to the hand-drawing. I do not know how much Mr. Pennell knows of the best camera work, but I, at least, have certainly seen many, many, and intolerably many dull drawings. The photograph, as the picture, depends on the man. We are told that this is not so. The contradiction to this statement lies in the exhibitions, where the personality of the worker will be seen to assert itself so strongly that is as easy to recognize at sight the photographs of certain men, as it is the pictures of certain painters.

But I am not claiming for photography a position equal to that of painting. It is in its infancy, and is to my mind already a prodigious infant. I rather wish to call the attention of photographers to that hostile criticism which has been largely deserved, and to suggest the lines by which it may be evaded.

I am not going to enter into the point of the professional photographer as against the amateur. The professional photographer has been greatly responsible for the abuse that has been poured out, but it is really not his fault. It is rather the fault of the public. The professional photographer must be a tradesman first and a photographer afterwards. As a tradesman he must sell his wares, and consequently have wares that will sell, that is to say, that the public will buy. The public buys what it likes, and it likes what it is accustomed to, and it has been accustomed from its infancy to a particular article that it knows as a "photo" or a "likeness." That is the professional's excuse. Therefore, when in this article I speak of a photographer, I do not mean a tradesman.

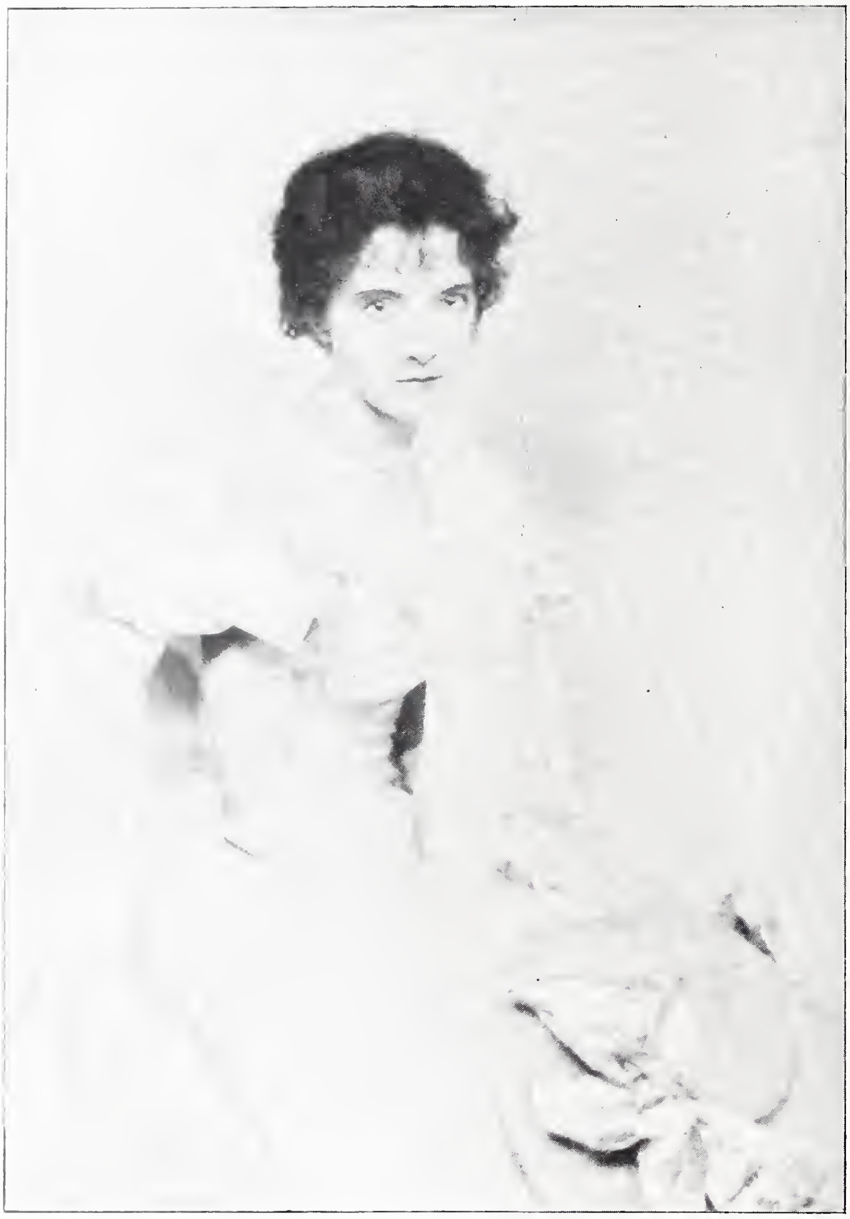
The point that photographers should bear in mind is that a photograph is not a painting. A photograph, in order to hold its ground, should be a pure photograph, and should owe nothing to handwork—handwork in the sense of brush or pencil work, and their equivalents,—for in all honesty there is no real difference between directing hot water out of the mouth of a jug and guiding a paint-brush. This I think must be the condemnation of some workers. I do not deny the beauty of the effects obtained, but it is not photography, and it is that which gives the handle of abuse to its enemies. To clear his ground at once, it should be a canon among all earnest photographers to allow no brush or pencil work, nor its equivalents, in any part of the process from the uncapping of the lens to the exhibition of the print. I make an exception for a mere technical defect beyond the control of the operator, such as a "pin-hole." The stopping of this is in no way hand-work on the picture.

I am aware that this is a hard rule. So many photographers would be perfect "but for that," and it seems such a pity to lose such a beautiful negative which may never be got again. All I can say is that the defect should not have been there. If you will, remedy the defect and say so, and do not exhibit it as a photograph.

"IN MEMORIAM" BY CLEMENT HOPKINS

But the real point is that photographers have assumed that a photograph is the same thing as a painting, and have accepted the criticism of painting as equally applicable to a photograph. This is the fundamental error. Except that it exhibits a visible natural form on a plane surface, photography is as different from painting as painting is from sculpture. How would vague talk of "suggestive mystery" apply to sculpture, to a bas-relief, let us say? Would the sculptor accept criticism of that sort? The canons of form and composition apply to all transcriptive arts, but all other canons are proper to the art and depend on the materials and tools used.

Photography, if it is to stand as an art, must associate itself from painting, and frame its own canons based on the experience of the tools and materials it uses. A determined and continued effort on the part of photographers will in time accomplish this, and claim recognition for the accomplishment. That time may not be yet, and a long and arduous journey is in front of us if we would reach that goal. But there is no cause for despair—rather for exceeding hope – for photography in the past twenty years has made most marvellous progress, and still moves forward. But much remains to be done, and in directions little attended to by artistic photographers. Their attention recently has been rivetted on printing processes, with greatly successful results. But for myself I do not feel certain that our plates are what they should be and will be, and I am confident that our lenses are all wrong. Until a plate will register exactly what is imaged on it, true



MISS DRUSCILLA CUTLER (MRS. HAROLD CHILD) BY CLEMENT HOPKINS

gradations of color, true, or at least, relatively true intensities of light and shadow, many a most beautiful aspect of nature must remain untranslatable ; and I cannot understand that we need for artistic photography an optical instrument that will produce faithfully, but too infinitely small to be discernible, the image of a pin a hundred yards distant.

The photographs that accompany this article are not examples of any individual canon of photography. I feel too uncertain yet to have formulated anything definite on that point. But they are examples of the rule I laid down, from photographs, untouched by any brush or pencil work or its equivalent in any stage, except for the stopping of some accidental plate or paper defect. I have a bad lens, a derision to opticians. I fancy it has optically most faults a lens can have. I shall never ask for a better. As for plates, the subjects were practically black and white, and the modern plate is fully equal to that.

In conclusion, and in giving the photographer some point of congratulation, I may draw attention to one great glory a photograph has over the other pictorial arts. I mean, its actuality. Nothing can take away the extreme pleasure of the knowledge that the picture before one is the actual impression of some reality, that the face that one looks upon is the fixed image impressed visibly and really by the face that one knows or knew in the flesh. And for this reason "In Memoriam" is of more sweet worth to me than a painting by the most celebrated of living portrait-painters.

Sea Water in Photography.—One of the most useful recent articles in *Photographic Scraps* is a communication by A. H. Sexton, F.I.C., F.C.S., on the use of sea-water in photography. He says that there is no reason why sea-water should not be used both for developing and fixing, except that the development is somewhat slower and that it is distinctly not recommended with ferrous oxalate. In using developers with sodium carbonate, the lime and magnesia are precipitated and turn the developer milky, but this is no practical disadvantage. For washing, sea water answers as well as fresh, except that it leaves salt in the film, and to prevent the hygroscopic action of the salt, it should be removed by soaking in two or three changes of fresh water. Sea water may also be successfully used for toning, fixing, and washing prints if care is taken to finally remove the salt. A special caution is given against the use of sea-water near the shore since it often contains a good deal of suspended organic matter, both animal and vegetable, which has a tendency to stick to the gelatine surfaces, and should be removed by filtering through good filter papers.

THE SUCCESSFUL DEVELOPMENT OF HAND-CAMERA EXPOSURES AND INSTANTANEOUS WORK IN GENERAL. BY B. O. B.

It is a recognized fact among all photographers that as soon as the stand-camera is laid aside, and a hand-camera employed in its stead, then the percentage of successful results becomes very small indeed, compared with what it formerly was. And if we were to inquire into the cause of this, we should find that in the majority of cases the great stumbling-block lies in the development of the instantaneous exposure.

I propose in this short article to give a few suggestions, firstly as to which developers are the most suited for this kind of work, and secondly as to the best way in which to employ them.

First among all combinations surely ranks our old friend pyro-soda. Many of the first hand-camera men of the age speak loudly in its praise; for general excellence of result it can hardly, in my opinion at least, be surpassed.

Hydroquinone by itself is utterly worthless for this kind of work. Not only is it tiresomely slow, but it accentuates contrasts to a very undesirable degrèe, and it will be admitted that "soot and whitewash" is not a desirable quality.

Allied with eikonogen, however, it is good, and is described by one worker as an ideal developer.

Of metol I have nothing but praise, except to deplore its nasty little habit of affecting the skin, a trick which makes many workers fight shy of it.

Amidol has no advantages over metol, which it much resembles, neither is it easy to obtain. It may therefore be dismissed without further remark.

Rodinal has been known to bring detail from an under-exposed plate when all other methods had failed, but negatives produced by its means seem to lack a certain bloom or vigor which is especially found with those developed by pyro-soda.

We will now proceed to give a convenient formula for each of the developers recommended, adding to each a few notes.

Before doing so, however, I should like to call your attention to a few hints which should prove helpful, whatever the developer.

Be certain that you obtain pure chemicals and work with clean dishes in a well-ventilated room. I know of more than one amateur whom failure attends, merely because he works with his legs perhaps up to his chin in a damp and "pokey" cellar, rendered nauseating by a smoking candle struggling to obtain a precarious existence under an inverted hock bottle, and only showing enough light to make everything else seem black by comparison. After a quarter of an hour's confinement, he is glad to crawl out, with cramped limbs and aching head and back, even at the expense of the cherished photograph.

GOING TO MARKET BY CLARENCE H. WHITE

No, if your dark-room is small—and what dark-room is otherwise, save, perhaps, that of a millionaire who dabbles in the engrossing art—if your dark-room is ill-ventilated, a common fault among dark-rooms I grieve to say, it is clear that you cannot remain in it for the lengthy period necessary for the successful development of an instantaneous exposure. What, then, must be done?

Some arrangement must be made so that the plate can be left under cover whilst the operator retires to enjoy a pipe and a glance at the paper. This is easily accomplished. All that is needed is the lid of a plate box, a size larger than the plate in use. If this is inverted over the developing dish, it will guard it safely from all extraneous light.

If plenty of dilute developer be used and air bubbles carefully removed with the ball of the finger to begin with, a plate in such condition may be safely left for a quarter or an hour without irregular markings appearing on its surface.

Now let us return to our developers. Pyro-soda was the one that I mentioned first, and first it shall be considered here. The "Ilford" formula is perhaps the best of its kind, but it is given in a form slightly inconvenient to use. I prefer, and always use, the following modification. You will see that I omit the sulphite, being a great admirer of those yellow negatives characteristic of pyro without a preservative. Those who prefer pure "black and white" may obtain it by adding sulphite in the same bulk as the carbonate. Here is the formula:

No. 1.

Pyro	1 ounce
Metabisulphite of potash	1 ounce
Water	30 ounces

No. 2.

Sodic carbonate	6 ounces
Potassium bromide	60 grains
Water	30 ounces

For use, take equal parts of each and two parts of water.

For instantaneous work start development with the following:

No. 1	¼ ounce
No. 2	½ ounce
Water	3 ounces

This being very dilute will take a long time to act, and perhaps an hour (certainly a half) will elapse ere details begin to make themselves apparent. As soon as this stage is reached, however, the plate is flooded with

No. 1	½ ounce
No. 1	1 ounce
Water	1½ ounces

which will soon complete the good work started by the dilute developer. The result for softness, detail and beauty will not be surpassed.

Eiko-cum-hydro, the distracting name applied to a combination of hydroquinone and eikonogen, next claims our attention. A reliable formula is the following:

Eikonogen	80 grains
Hydroquinone	30 grains
Sodium sulphite	1 ounce
Potassic bromide	40 grains
Water	15 ounces

This is No. 1.

No. 2 consists of:

Sodic carbonate	40 grains
Sodic hydrate	20 grains
Water	15 ounces

Hot water should be used to ensure complete solution of the various ingredients. Users of compounds containing eikonogen should not be deceived by the rapid way the image flashes up even in cases of under-exposure. Time, and often considerable time, must be given to permit of density being imparted to the film.

Methyl-para-amido-meta-cresol—— "What the dickens!" I hear my readers ejaculate as they stop their ears. Well, in plain words, metol is, as I have before remarked, an excellent developer, and has lately obtained a world-wide popularity. It is cleaner to use than our old friend pyro, but if your skin is at all delicate, by all means wear a pair of india-rubber gloves and be on the safe side.

It makes an admirable one-solution developer; about the only developer of the one-solution type suitable for hand-camera exposures. When using it, as with eikonogen, it should be borne in mind that detail comes first and density afterwards, exactly the reverse of pyro and hydroquinone.

Below will be found a formula admirably suited for instantaneous exposures:

Metol	360 grains
Sodium sulphite	7 ounces
Potassium carbonate	3½ ounces
Potassium bromide	40 grains
Water	40 ounces

Negatives developed by metol are of a blue-black tinge, a fact which renders them more actinic than those developed by pyro.

Rodinal consists of a highly-concentrated solution of para-amido-phenol, sodium sulphite, and a caustic alkali. For use, it must be diluted to about twenty times its bulk with water, and potassium bromide added in the proportion of a grain to every 2 ounces of solution. Thus made up it is extremely handy for use, and will keep indefinitely. In this form it is A1 for short exposures, bringing out detail to a marvelous degree.

In conclusion I must once again remind the reader of the great secret of successful instantaneous work. Use dilute solutions, never "force" the plate, and develop for detail rather than density. This last will be found to come quite soon enough without any special attention. Too soon in most cases.—*The Amateur Photographer* (English).

NATURALISTIC PHOTOGRAPHY. BY P. H. EMERSON, B.A., M.B. (CANTAB).

CHAPTER IV.

(*Continued from Page 61.*)

THE STUDIO.

For portraiture a studio is a necessity for obtaining the best results. We shall very briefly discuss the question of studios, for we hold that, provided a studio be large enough and light enough, there is not much else to consider. We have been in several studios, and worked for a considerable time in them, one of which we, having hired, had all to ourselves, so that our remarks are based on the experience of studios photographic as well as on those of painters and sculptors.

The best light is undoubtedly a top light and a side light, the side light reaching to within a few feet of the ground. It is a common fallacy among some portrait photographers that the side light should reach to the ground, so that the boots may be lighted. Such an idea evidently arises from a misconception of the thing required; the boots are to be subdued as much as possible, it is the model's portrait we want, not that of his boots. The studio in this country should, if possible, face north or northeast, the roof sloping at a inclination of half a right angle. There should be no tall buildings standing near it, as exterior shadows and reflections interfere with the purity of lighting.

We do not intend to give specifications for the building of a studio, for this has been already admirably done; this proviso only being made, that the studio be made long enough to use long-focus lenses so that we shall get better results. The glazing should not extend from one end of the studio to the other; an unglazed space should be left at each end. By curtains the length of glazing can always be shortened. A gray distemper is perhaps the most suitable color for the walls.

Successful portraits can be taken in ordinary sitting-rooms, but we do not think the best results can be obtained in this way, although fine pictures of the man and his surroundings can be obtained, but not the best portrait pictures, on account of the inferior and comparatively ill lighting, although there are, no doubt, rooms in private houses as good as any studio, but such cases are exceptionable.

Regarding business arrangements and conveniences, we have nothing to do with them.

FURNITURE.

The old, and even modern, portrait painters are answerable for many of the faults to this day committed by photographers, because they take portrait painters as models Lawrence was especially guilty in the use of conventional backgrounds and accessories. Of photographic furniture, as generally understood, there should be *none*. The studio should be furnished simply, and with taste, as an ordinary sitting-room. There should be no shams of any kind, and the furniture should be chosen with a regard to unobtrusiveness and grace, rather than massive beauty. All heavy curtains, draperies, hot-house plants, and such incongruous lumber, should be avoided. It should be remembered that what is wanted is a portrait—the face, or figure, or both—and all accessories should be subdued. It is very little use to lay down rules for these things, all must depend on the individual taste of the photographer.

But, above all, avoid shams and cheap ornamental objects, such as cheap bronzes, china pots, and Birmingham *bric-a-brac*. The chairs should be upholstered with some good plain colored cloth, with no pattern, and the floor carpeted with matting, or a simply colored carpet without pattern. Let simplicity and harmony predominate. The room in fact should be a harmony in some cool color, and the furniture should not be *felt* when in the room.

Head-rests must be entirely tabooed. We have taken many portraits some with very long exposures and no head-rest was necessary. In nine cases out of ten it simply ruins the portrait from an artistic point of view

Reflectors, on light stands, should be ready for use; but it is obviously erroneous to use large and unwieldy reflectors. The reflector is really only necessary for the head and shoulders; for our object is to subdue all other parts as much as possible.

All artificial backgrounds should be banished, together with such stupid lumber as banisters, pedestals, and stiles: they are all inartistic in the extreme. It is a false idea to represent people in positions they are never found in—such as a girl in evening dress against a seascape, and all the other hideous conventionalties of vulgar imagination. The background—which is a matter of vital importance—should be arranged to suit the sitter, that is, a harmony of color should be aimed at. Light fabrics without patterns, skins, or pieces of tapestry, will serve every purpose and give more desirable results. The portraitist should keep a selection of pieces of fabric of light hues, and a light skeleton screen can be kept ready, to which to tack them as required, suiting the color to the dress of the sitter. Gradated backgrounds are a mistake, the tonality is much better shown by having a background of one tint, and so arranging the light that the modelling and tonality shall be decorative.

Breadth and simplicity are the foundations of all good work. The background should never be placed close behind the sitter, as is customary; but its distance from the sitter should be studied with the lighting. As a rule, it is better to place the background three or four feet from the back of the sitter. What is required, is that the head shall melt softly into the background, and yet retains its modelling.

The camera should work with a shutter—the Cadett pneumatic shutter for portraiture being as good as any we know—and the pneumatic apparatus should have a very long india-rubber tube attached, for reasons to be explained later on.

Means may be arranged for taking pictures by artificial light, if necessary, though personally we do not care for them. The tonality, though true to the light, has a false, artificial appearance by day. There are many methods of making artificially lighted pictures; the best, in our opinion, are those taken by the electric light. Others are done by gas, and by magnesium flashes—a method quite recently revived as something new, and for certain groups, most useful. The best of those we have seen gave results that appeared to us somewhat artificial.

You must remember that in a studio you are aking a person *in a room*, and that is the impression you must try to get in your picture *It is a false idea and an inartistic one to endeavor to represent outdoor effects in a studio.* Studio lighting and outdoor lighting are radically different, and in a studio you have only to try and give an *indoor effect.* This has been the principle of all great artists. None but an amateur could fail to notice the falsity of lighting as seen in outdoor subjects taken in the studio. On the other hand, in a studio you may get any effect of lighting you can for indoor subjects, for all such effects are to seen in a room by a careful observer. Adam Salomon took many of his portraits in front of a red-glass window. This is quite legitimate, as is also the arrangement of fabrics for the background, and the dictating what colored dress the sitter shall wear. Let our student work in harmonies of color as much as possible, and let him never take outdoor effects in a studio. Make the room as much like a comfortable sitting-room as possible, and hide all the tools of the craft.

CHAPTER V.

FOCUSING

Having now seen the principles by which we must be governed, and the apparatus required, we will briefly apply them.

By focusing we understand, bringing the ground-glass into the plane which coincides with the sharpest projection of the image called the focal plane; the position of this plane varying of course with the focal length of the lens and the distance of the object from the lens. Presuming, then, that the camera is in register, and set squarely before the object to be photographed, as can be determined by the spirit-level, let the student proceed to focus his picture as sharply as he can *without any* "stop." He must be careful that the swing-backs are parallel to the front planes of the camera.

Now the great habit to cultivate is to think in values and masses, that is, you must, in your mind, by constant practice, analyze nature into masses and values, and if you constantly practise this at the beginning, you will find that it becomes a habit, and automatically, as you look at a scene or a person, you will see on the ground-glass of your mind the object translated into black and white masses, and you will notice their relative values. This habit is absolutely necessary for good work, for it is by this analysis that you will learn to know what is suitable for pictorial art, and what is not; for if the masses and values in a picture are not correctly expressed, nothing will ever put the picture right. Our own experience has been that where this analysis has left an impression of a few strong masses, the picture has always been stronger when finished than otherwise. Now our student, having sharply focussed his picture with open lens, must take his head from beneath the focusing cloth, and look steadily at his picture ; fixing his eye on the principal object in the picture, he should go through this mental analysis, and at the same time note carefully how much detail he can see, both in the field of direct and indirect vision ; and his object should be to render as truly as possible the impression thus obtained. He should then look on the focusing screen, and putting in his largest diaphragm, and using his swing-backs, and altering the focusing as may be necessary, see how truly he can get this impression, always remembering that the larger the diaphragm he uses the better, for he will remember that after a certain aperture many useful aberrations are cut off. For this reason he should always begin with an open aperture, and work down to the smaller size diaphragm as needed. By working in this way, he will soon see command he has over his translation, all by the judicious use of his focusing screen, swing-backs, and diaphragm combined. In focusing he must remember one thing—never to focus so that it can be detected in the picture where the sharper focusing ends and the less sharp focusing begins—as can be brought about by diaphragms. The sharpness should be gradated gently. He must also remember that the ground-glass picture is false and deceptive in its brightness, even in a perfectly aplanatic lens, due to obvious physical facts. This is a point of great importance, which must not beforgotten. The ground-glass picture, though greatly admired by the Tramontane masters, and approved by Canaletto and Ribera, as Count Algarotti assures us in one of his raptures on the camera obscura, is not so natural and beautiful as it may appear from the toy point of view—it is not what the artist wants, any more than he wants the pictures of an ordinary camera obscura, for if these pictures were satisfying in an artistic sense, every one could, by erecting a camera obscura, have the satisfaction of his desire, and there would soon be an end to the pictorial arts, for no one who loved this picture so dearly would want a camera to take photographs with, but only one to look through. The deceptive luminosity of the ground-glass picture must not be allowed to influence our normal mental analysis of the natural scene. As we said before, therefore, the principal object in the picture must be fairly sharp, *just as sharp as the eyes see it, and no sharper* ; but everything else, and all other planes of the picture, must be subdued, so that the resulting print shall give an impression to the eye as nearly identical as possible to the impression given by the natural scene. But, at the same time, it must be distinctly understood that so-called "fuzziness" must not be carried to the length of *destroying the structure* of any object, otherwise it becomes noticeable, and by attracting the eye detracts from the general harmony, and is then just as harmful as excessive sharpness would be. Experience has shown, that it is always necessary to throw the principal object slightly (often only just perceptibly) out of focus, to obtain a natural appearance, except when there is much moisture in the air, as on a heavy mist-laden gray day, when we have found that the principal object (out of doors) may be focused *quite sharply*, and yet appear natural, for the mist scattering the light softens the contours of all objects. In the cases of lenses with positive spherical aberration this holds to, but they are more suitable for portraiture, though at times they will do for figure subjects, but as a rule the conjugates in landscape are too widely apart to give them advantage. Nothing in nature has a hard outline, but everything is seen against something else, and its outlines fade gently into that something else, often so subtilely that you cannot quite distinguish where one ends and the other begins. In this mingled decision and indecision, this lost and found, lies all the charm and mystery of nature. This is what the artist seeks, and what the photographer, as a rule, strenuously avoids.

As this loss of outline increases with the grayness produced by atmosphere, it follows that it is greater on grey days and in the distance ; and less on bright, sunshiny days. For this reason, therefore, the student, must be very careful on bright days about his focusing, for on such days there is often no mist to assist him, but still he must keep the *planes separate* and attain good modelling, or he has no picture. Let us image an example : A decaying wooden landing-stage stands beneath some weeping willows at the edge of a lake. From the landing-stage a path leads through a garden to a thatched cottage one hundred yards distant; behind the cottage is an avenue of tall poplars. On the landing-stage stands a beautiful sun-bronzed village girl in a plain print dress; she is leaning against the willow and is looking dreamily at the water. We row by on the lake, and are struck by the picture, but above all by the dazzling native beauty of the peasant girl; our eyes are fixed on the ruddy face and we can look at nothing else. If we are cool enough to analyze the picture, what is it we see directly and sharply? The girl's beautiful head, and nothing else, and we can only see that from one point of sight. We are conscious of the willow-tree, conscious of the light dress and the decaying timbers of the landing stage, conscious of the cottage, away in the middle distance, and conscious of the poplars telling blue and misty over the cottage roof; conscious, too, are we of the water lapping round the landing-stage;—we feel all these, but we see clearly and definitely only the charming face, unless we move our head. Thus it is always in nature, and thus it should be in a picture. Let us, however, still keep to our scene, and imagine now that the whole shifts, as does scenery on a stage; gradually the girl's dress and the bark and leaves of the willow grow sharp, the cottage moves up and is quite sharp, so that the girl's form looks cut out upon it, the poplars in the distance are sharp, and the water closes up and the ripples on its surface and the lilies are all sharp. And where is the picture? Gone! The girl is there, but she is a mere patch in all the sharp details, all relief, contract and modelling are lost. Our eyes keep roving from the bark to the willow leaves and on from the cottage thatch to the ripple on the water, *there is no rest*, all the picture has been jammed into one plane, and all the interest equally divided. Now this is exactly what happens when a deep focusing lens with small diaphragms is used, the operator (for no artist would do this) tries to make everything sharp from corner to corner. Let the student choose a subject such as we have suggested, and put what we have imagined into practice, and he will see the result; he must, for scientific reasons, lose modelling and so flatten his picture, to say nothing of other causes. Yet this "sharp" ideal is the childish view taken of nature by the uneducated in art matters, and they call their productions true, whereas, they are just about as artistically false as can be. For this reason, too, it must be remembered that the foreground is not always to be rendered sharply. If our principal object is in the middle distance, let us say, for example, some cottages on the border of a lake; our foreground, consisting we will suppose of aquatic plants, must be kept down, and purposely made unimportant. This is done chiefly by the focusing and stopping.

Among the few satisfactory portraits we have seen, that fatal sharpness has been avoided. The well-known miniature painter, Sir W. J. Newton, one of the first vice-presidents of the Photographic Society of Great Britain, distinctly advised that all portraits should be thrown a "little out of focus." The falsity of focusing a head sharply is shown by the fact that by doing so freckles and pimples, which are not noticed by the eye, stand out most obtrusively, indeed a case is on record, where an eruption of small-pox was detected in its earliest stage by the lens, while nothing at all could be detected by the eye, though this was but partly due to the lens, but this was partly owing to chemical reasons. This false focusing has brought in its train another huge falsity—retouching—of which we shall speak more fully hereafter.

Sharp focusing, too, by making objects tell relatively too strongly, throws them out of tone, and so ruins the picture. When sharpness is obtained by stopping down, the diaphragm cuts off light and injures normal brilliancy, flattens the modelling, cuts off the useful aberrations, exaggerates shadows, and so throws the picture out of tone. Of course, if the object in view is to produce a diagram for scientific purposes such, for instance, as photographs of flowers for a work on botany, or of fish for a work on ichthyology, or of butterflies for a work on entomology, the most brilliant illumination possible should be aimed at, and the focusing should be microscopically sharp, for such works are required to show the *structure* as well as the form, but even in these the modelling must not be flattened. But, above all, the drawing should be correct, and this is obtainable only by the correct use of lenses, which, as we have pointed out, has not always been the case. If, on the other hand, the operator wishes to produce *pictures* of flowers, butterflies, fruit, fish, &c., the same rules hold good as for any other *picture*. As an example of the treatment of flowers, the student will do well to study Mr. Fantin's paintings of flowers.

(*To be continued.*)

ARTISTIC PHOTOGRAPHY.

The *Art Amateur* for January, of the current year, prints an article on the above subject, in connection with an extensive review of the new book, by Mr. W. I. Lincoln Adams, entitled "Sunlight and Shadow," which contains so much good advice we have found space for the article entire.

"In recent years," says *The Art Amateur*, "the technical gains made in photography have been more than equalled by the general advance in artistic purpose and method. Many of our amateur photographers, in particular, show a sense of what is pictorial in subject and treatment which would do no discredit to a trained artist; and their success in making of the camera an instrument of art has given a new turn to the ambition of most beginners. For a long time, the one test of merit was a faithful reproduction of detail, no matter how commonplace or even ugly; but now almost every one has learned the value of breadth and simplicity of effect, and of contrast and harmony in grouping. It can no longer be said that the photographer invariably passes by what the artist would select, and the term photographic is no longer a synonym for hard, crude, and uninteresting.

The change has been brought about, in part, by new methods of printing, but mostly by an awakening of the artistic conscience. Photographers have, in short, discovered that there are such things as tone, composition, and effect, and that they may be obtained with the camera as well as with the brush. They sometimes attempt, in addition, to tell, or rather suggest, a story, usually with less happy results. It introduces a new interest, frequently at war with the pictorial interest. People may be engaged in a most exciting adventure, and yet their actions may be awkward, their grouping confused and ineffective. To the real artist the pictorial qualities of the subject are of much more account than the story. If he fails to secure them, he considers his work a failure, if he gains them and nought else, he congratulates himself on a success. For the sake of the beginner, to whom this whole matter of pictorial effect is new, we will here explain what it is, and how it may be obtained with the camera.

A VIEW AT HILLTOP FARM, WHITE MOUNTAINS, NEW HAMPSHIRE
BY W. I. LINCOLN ADAMS

In the first place, it is obvious, for the reason just given, that the amateur had better choose at first subjects which have *only* an artistic interest; and of these the best are landscapes. We have such a strong interest in our fellowmen and in familiar objects—houses and the like—that any recognizable portrait of them is sure to please, though it may be entirely devoid of artistic merit. If we would judge our own work from the artistic side, we should at first avoid such subjects. But an unfamiliar landscape is likely to strike us by its pictorial aspects solely. We are impressed by the mass and the rugged grandeur of the mountains, by the exquisite outlines and delicate colors of the clouds, by the appearance of order and mystery in foliage, and, perhaps, most of all, by those broad effects of light and vapor which change the whole expression of a landscape in a few seconds from grave to gay, from vague and dreamy to distinct and clear. To secure those effects, we need little more than a certain knowledge of nature's moods and tenses, which gives us the ability to foresee them and to recognize them when they come. We must be on hand at the moment when clouds, light, and the forms of the landscape conspire to produce the best effect. Is the scene a bold and rocky one? Let us wait until the forms of the cliffs are thrown out by masses of black shadow, and towering, cumulus clouds lead the eye still upward from their summits. Is it flat and level? The long, horizontal shadows of morning or late afternoon, and the many parallel ranks of clouds marshalled by a steady wind will add greatly to its effect. The fleeting forms of mist rising after a shower intensify by contrast the solidity and look of permanence of the hills. In a woodland landscape, full of varied forms, the repetition of one or two of those in a small pool or quiet reach of a stream makes a central point of interest, wisely grasped and remembered, over which the eye is glad to rest.

The choice of a point of view has, also, much to do with the effect. Mountains usually look best from below. There is the exhilaration of climbing and the triumph of getting to the top; but nothing is tamer than the average mountain landscape seen from a summit, unless it is the sea when one is out of the sight of land. Each may be in other ways impressive, but they do not afford good pictures, for lack of contrast. Similarly, the best pictures that a forest country contains are to be found along the edges of the woods or in clearings. As a rule, whatever the general character of the scene, look for some note of contrast to make the center of your picture, and then wait for the unifying effect of weather and light, which will intensify the expression of both.

By the time that these matters are learned the young photographer will have found that he is not entirely dependent on nature. Art may legitimately have something to do with the result. He may aid a subject in which a tall tree, a rock, and a towering mass of cumulus cloud occur by choosing an oblong plate and setting it vertically, or he may utterly ruin his picture by making it horizontal. Square, oval, and circular forms have also their advantages and disadvantages, and should not be used at random, but in accordance with the character of the scene. It will be well frequently to try the effect of each shape. The focus of the lens is also a point of importance, since it enables one to bring out distinctly either foreground or background at pleasure. And, as we have said, the method of printing must be chosen with discrimination. The color—a warm brown, or cold gray, or purple—may give a hint of the dominant tone. A warm color is, of course, the best for sunny effects, a cold one for cloudy days and winter scenes. It is worth while, also, to consider the texture of the paper. A rough drawing paper, printed on with bromide or platinum, may have much the quality of a fine sepia or Indian ink drawing.

The prejudice which artist-photographers once had against the small hand camera is rapidly passing away. It is really the best instrument for general out-of-doors work, as it can be easily carried about into difficult places, and it is possible with it to secure passing effects at a moment's notice. A successful amateur gives the following as the principal points of a good instrument. It should have no complicated mechanism, should be light-proof and water-proof. The shutter should work only moderately fast, but the plates should be the fastest possible. The result should be sharp enough to stand enlargement, for it is the picture of a size to mount and frame, and not the microscopic one that is desired; but extreme minuteness of detail is not only not necessary, but it may interfere with the great quality of breadth even in the enlarged copy.

We do not mean to say that the amateur should deny himself figure work altogether. When he comes to look upon a human figure as something more than a possible friend or enemy—when he comes to regard, first of all, its relations of size, shape, and color with surrounding objects, and is determined that these relations shall be satisfactory to the eye, whether his figure suggest a story or does not, he may then introduce the figure freely, and will find it a great help in landscape composition, whether one takes a companion with him or even preferably, waits for the farmer or the stray pedestrian to come and pose, all unconsciously, just where he is wanted. Dress has much to do with the effect. A cityfied young man looks as ridiculously out of place in the country as a farmer, in his shirt-sleeves and smoking a corncob pipe, would in a city drawing-room. It is not only that the person is "where he does not belong"—that we know only by reflection and inference; but the lines and colors of his dress are as much out of keeping with those of nature as a wire fence or a flaring advertisement, and are a direct offence to the eye. Again, as we never quite conquer our *unpictorial* interest in humanity, the main difficulty is to keep it unobtrusive. The young photographer invariably errs in making his figures too prominent. They should not detract from but should add to the general effect of the scene. Or, if the figure is really in itself picturesque, it is best to include but little landscape, and throw that slightly out of focus, so that it may serve simply as a back-ground. Nothing is more ruinous than a contest of interests.

EVENING, SHADOWS BY W. I. LINCOLN ADAMS

Combination printing—that is to say, the printing of various parts of the same picture from separate plates, made at different times—is not to be recommended to the beginner. It requires an intimate knowledge of natural effects, which is to be gained only by years and years of practice, and it requires also a large collection of plates to choose from. But it is often well to make several negatives of the same scene at the same time and to print a combination picture from those, because the exposure that gives good results with a foreground may leave the sky a blank, and that which answers in the case of the sky may give a blurred and over-exposed landscape. Even this, however, requires much judgment, and good results are not to be expected at once. Another necessary caution is not to let color, as such, influence one in choice of subject, for the sufficient reason that photography—at least as known to the amateur—does not as yet register color, but only values.

When the figure is much more than a significant blot in the landscape, it becomes extremely difficult to handle out of doors; and the beginner had better get his initial practice in his studio, where the arrangement of the light and of accessories is more under his control. Every photographer knows how necessary it usually is to throw light upon the shadowed side of the face in order to bring out the modeling, and what a disagreeable effect a plain top light has upon the expression of most faces. But photographers frequently go too far in the way of lighting a face equally all around by means of reflectors. For male heads, especially, the contrast of a shadowed side with a light side serves to bring out the character of the subject; but a *little* light should be cautiously thrown into the shadow, just sufficient to make the features distinguishable. For this purpose the arrangement of reflectors devised by Mr. J. Wells Champney, and fully described in an interview with him printed in a former number of the *Art Amateur*, is the best possible. Mr. Champney poses his subject against a window, the lower part of which is darkened. From the top of the window depends a white sheet which can be drawn at an angle into the room, and the softened light is reflected from it upon the model. If necessary, a mirror may be introduced behind the model to again reflect the light from the back, and a white sheet laid upon the ground in front of her conquers the severity of the top light. With one or two more mirrors and light-colored curtains or screens any desired arrangement of reflected lights may be made, and the effects produced by the careful manipulation of these is sometimes most surprising. Even out of doors a good deal may be done in this way with canvas screens to shut off a too strong light from the figures or reflect it softened upon them; but the beginner has much to learn before he will need to make use of such appliances.

It should hardly be necessary to say much on the subject of linear composition. Do not include uninteresting spaces or objects. Do not let the principal object be too near the edge of the picture, nor yet in the exact center, which looks too formal. All the important objects taken together should fit into, or nearly fit into, some simple figure, as a rectangle, triangle, pentagon, circle, or oval; commonly, the triangle with its apex turned upward is the most satisfactory form that a group of objects can take. But here, as in the composition of values of masses, the main thing is not to think of objects according to their usual classes, grouping trees with trees, and men with men, but to consider all indifferently as shapes and colors in a pattern. If the pattern is pleasing, the picture is, so far, a success. If it is not pleasing, it is artistically no picture at all To be pleasing, there should be variety, there should be some slight element of contrast; but above all, there should be a dominant form and tone, superior to all the details and variations of color in the picture. The student will find much of value in the book on photography, "Sunlight and Shadow," just brought out by Messrs. Baker & Taylor, which was reviewed in our columns last month."

STUDY. BY J. R. SWAIN.

Now that the long winter evenings are upon us the progressing photographer should devote some time each evening to the study of some special subject in his chosen profession. Take one subject at a time, thoroughly master that in all its details before attempting another. It is one thing to skim over a subject and think we know it, and quite another thing to dig down to the very bottom of it, and know that we know it. The difference is the difference between success and failure. The photographic magazines should be carefully read. This need not take more than half the time you will have for reading if you manage carefully.

Suggestions as to the best use of this remaining time is the object of these lines. The extra time mentioned should be spent in systematic reading. Choose a subject, some practical subject as lighting and posing, the most important subject in all photography. Determine to know that can be known about it. Study the pictures in the magazines. Criticize them. Find their good points as well as their bad points, if any. Exchange books with your photographic neighbors until you have consulted every available authority on the subject. Add all your own practical experience in that particular line. Before taking up another subject, write a resumé of the knowledge you have acquired for future reference or possibly for publication. You will be surprised with what confidence you can speak, and what you say will be worth hearing or reading. Refraction is another subject of equal importance. All photographers know that the image is inverted on the ground glass. Very few can tell why, or even why the image is formed at all.

The subject of lenses must be studied in connection with refraction. Then the different kinds of lenses and what constitutes the difference between them; what is meant by an achromatic lens, chromatic aberration, spherical aberration, etc. It is just as important for a photographer to thoroughly understand the tools he works with, and just what he can accomplish with them as it is for an engineer to understand the engine he controls.

What a wonderful stride photography would make in the next few years, if every reader of this journal was a student. Don't say that it is too late, and that you are too old. It is never too late to do good; and if you are fifty or sixty years old, or even above sixty, it is worth while to begin.

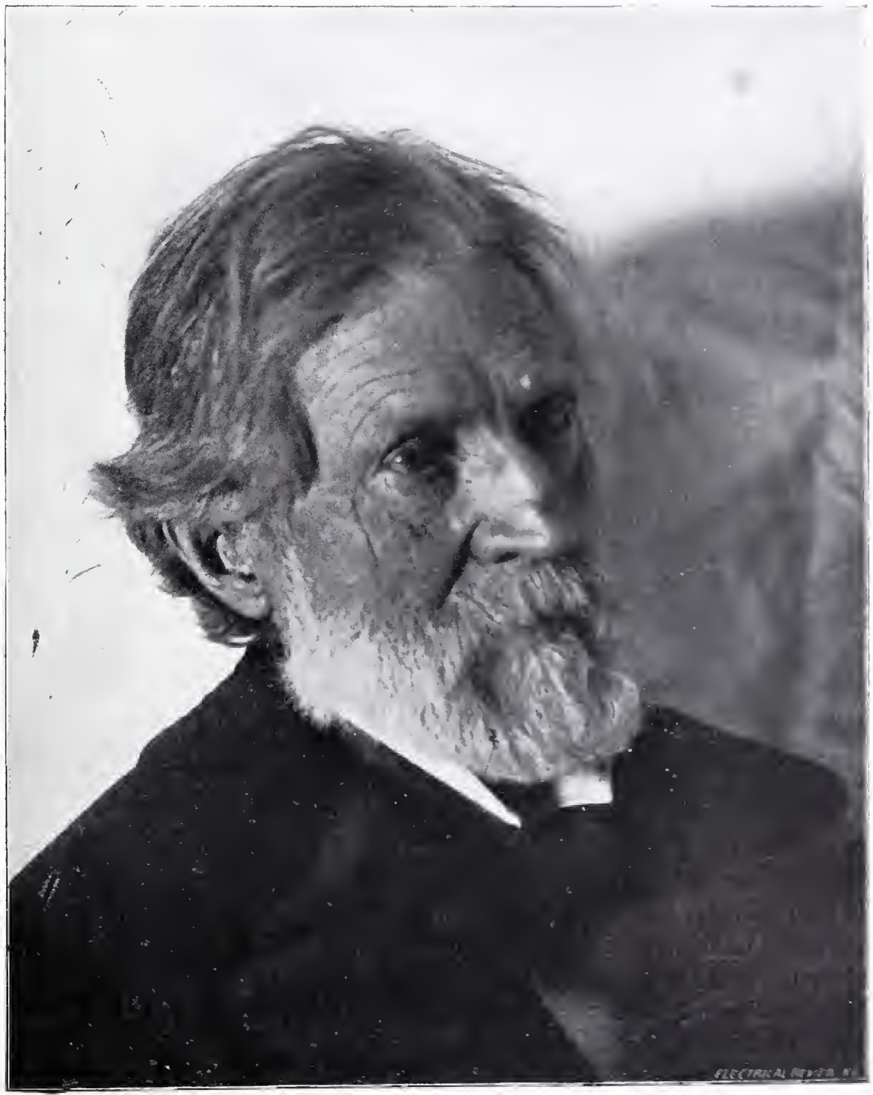
CHILD STUDY BY C. G. APPLETON

EDITORIAL NOTES

We have received a large number of inquiries regarding the process of color photography advertised in the last issue of our magazine. We refer our readers to the article by Dr. Gibson which appears in this issue, and explains the process. Some samples can be seen at the offices of the Scovill & Adams Co., the trade agents.

* * *

Nikola Tesla, in a recent issue of *The Electrical Review*, gives the following interesting details of his experiments in Photography by means of the light emitted by vacuum tubes. He says:—A few years ago I began a series of experiments with a view of ascertaining the applicability of the light emitted by phosphorescent vacuum tubes to ordinary photography. The results soon showed that, even with a tube giving no more light than the equivalent of one half of a candle, objects could be easily photographed with exposures of a few minutes, and the time could be reduced at will by pushing the tube to a high candle-power. Photographs of persons were likewise obtained at that time, and, if I am not mistaken, these were the first likenesses produced with this kind of illumination. However, a number of facts, not pertaining to the subject presently considered, were observed in the course of these experiments, which, had they been immediately published, might have materially hastened important sci-


ELECTRICAL REVIEW, N.Y.

From the Electrical Review.

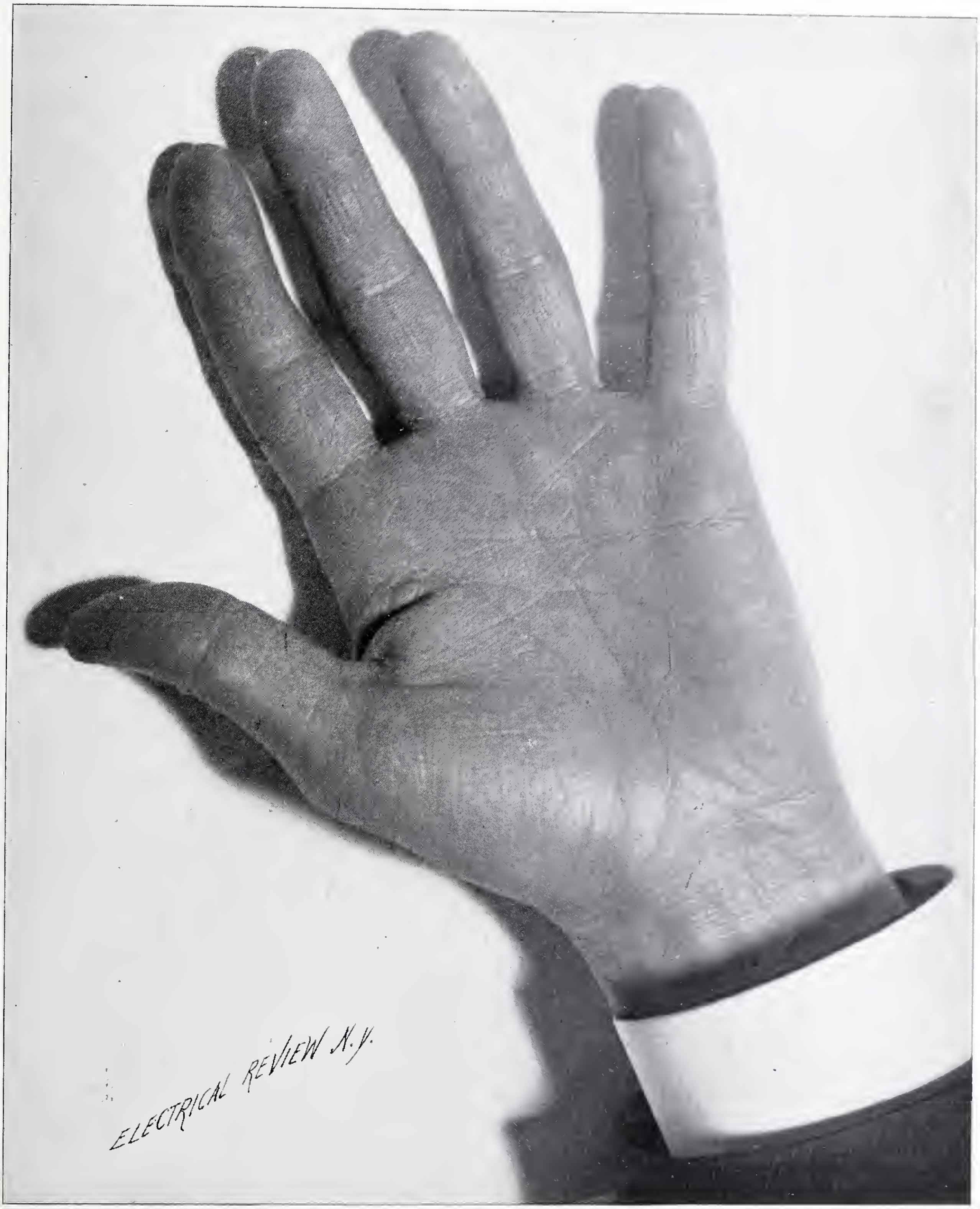
FIG. I.—"TESLA'S LATEST ADVANCES IN VACUUM-TUBE LIGHTING." PHOTOGRAPH MADE BY THE LIGHT OF A SINGLE VACUUM TUBE, AT A DISTANCE OF FIVE FEET: EXPOSURE, FIVE SECONDS

entific developments which have taken place since. To dwell on these and other experimental results obtained at that time, more extensively at the first opportunity, is one of my good resolutions for the coming year. A calamity, unfortunately, interrupted my labors for a short period, but as soon as I was able I took up again the thread of the investigation, which was not only interesting in connection with the principal object in view, but was also useful in many other respects. So, for instance, in making observations as to the efficiency or any peculiarity of the vacuum tubes, the photographic plate was found to be an excellent means of comparison, note being taken of the distance and time of exposure, character of the phosphorescent body, degree of rarefaction and other such particulars of moment.

A rather curious feature in the photographs obtained with tubes of moderate illuminating power, as a few candles, was that the lights and shadows came out remarkably strong, as when very short exposures are made by flashlight, but the outlines were not sharp and practically no detail was visible. By producing tubes of much greater candle-power, a notable improvement in this respect was effected, and this advance prompted me to further efforts in this direction, which finally resulted in the production of a tube of an illuminating power equal to that of hundreds, and even thousands, of ordinary vacuum tubes. What is more, I believe that I am far from having attained the limit in the amount of light producible, and believe that this method of illumination will be eventually employed for light-house purposes. This probably will be considered the oddest and most unlooked-for development of the vacuum tube.

Simultaneously with this progress a corresponding improvement was made in the efficiency of the light produced. A few words on this point might not be amiss, considering that a popular and erroneous opinion still exists in regard to the power consumed by vacuum tubes lighted by ordinary means. So deeply rooted is this opinion which, I will frankly confess, I myself have shared for a long time, that shortly after my own first efforts, Sir David Solomon's and Messrs. Pike & Harris undertook to introduce in England such tubes on a large scale in competition with the incandescent system of lighting The enterprise, which was commented on in the technical periodicals, was commendable enough, but it was not difficult to foretell its fate; for although the high-frequency currents obtained from the alternator yielded better economical results than interrupted currents, and although they were obtained in a convenient and fairly economical manner, still the efficiency of the whole system was necessarily too small for competition with incandescent lamps. The reasons for the great power consumption, which may often be as much as 10 times that taking place in incandescent lamps for an equivalent amount of light, are not far to seek. A vacuum tube, particularly if it be very large, offers an immense radiating surface, and is capable of giving off a great amount of energy without rising perceptibly in temperature. What still increases the dissipation of energy is the high temperature of the rarefied gas. Generally it is supposed that the particles are not brought to a high temperature, but a calculation from the amount of the energy consumed during a given period of time, and the amount of matter contained in the tube, leads to results which would seem to indicate that, of all the means at disposal for bringing a small amount of matter to a high temperature, a vacuum tube is the most effective. This observation may lead to valuable uses of such tubes in astronomical researches, and a line of experiment to this end was suggested to me recently by Dr. Geo. E. Hale, of the Yerkes Observatory. As compared with these disadvantages the incandescent lamp, crude and inefficient as it undoubtedly is, possesses vastly superior features. These difficulties have been recognized by me early, and my efforts during the past few years have been directed towards overcoming these defects and have finally resulted in material advances, so that I find it possible to obtain from a tube of a volume not much greater than that of a bulb of an incandescent lamp, about the same amount of light produced by the latter, without the tube becoming overheated, which is sure to take place under ordinary conditions. Both of these improvements, the increase of the candle-power as well as degree of efficiency, have been achieved by gradual perfection of the means of producing economically harmonical electrical vibrations of extreme rapidity. The fundamental principle involved is now well known, and it only remains to describe the features of the system in detail, a duty with which I expect to be able to comply soon, this being another one of my good resolutions.

The purpose of the present communication is chiefly to give an idea in how far the object here


ELECTRICAL REVIEW N.Y.

From the Electrical Review.

FIG. 3.—"TESLA'S LATEST ADVANCES IN VACUUM TUBES." PHOTOGRAPH OF THE EXPERIMENTER'S HAND MADE BY THE LIGHT OF A SINGLE IMPROVED VACUUM TUBE OF 1,000 CANDLES. EXPOSURE TWO SECONDS; DISTANCE FROM THE TUBE FOUR FEET

aimed at was obtained. The photographs shown were taken by a tube having a radiating surface of about two hundred square inches. The frequency of the oscillations, which were obtained from an Edison direct-current supply circuit, I estimated to be about two million a second. The illuminating power of the tube approximated about one thousand candles, and the exposures ranged from two to five seconds, the distance of the object being four to five feet from the tube. It might be asked why, with so high an illuminating power, the exposures should not be instantaneous. I would not undertake to satisfactorily answer this question, which was put to me recently by a scientific man, whose visit to my laboratory I still vividly recollect. Likenesses can, of course, be obtained with instantaneous exposures, but it has been found preferable to expose longer and at a greater distance from the tube. The results so far obtained would make it appear that this kind of light will be great value in photography, not only because of the fineness of the lines, but also because the artist will be able to exactly adjust the conditions in every experiment so as to secure the best result, which is impossible with ordinary light. He will thus be made entirely independent of daylight, and will be able to carry on his work at any hour, night or day. It might also be of value to the painter, though its use for such purposes I still consider problematical.

I anticipate that much detail will naturally be lost in the reproductions through the half-tone process and press work, however good, but I hope that enough will be shown to demonstrate the advantageous features of this light in photography and its practical usefulness in this art.

In conclusion, I wish to thank Mr. R. L. Newman for kindly consenting to the use of his photograph."

= = = = =

THE following story is told of Mark Twain:—When in Vienna he made a day-time visit to the new Burgtheatre. All parts of the building were illuminated in his honor.

Just before he left the house an amusing incident occurred. To get a last view of the brilliantly-lighted audience room, he leaned far over the railing of the royal box, in which he was standing. Suddenly he was startled by a loud cry of "Get back!" At the same instant a photograph of the place was taken, and there was a narrow escape from shocking the conservative Viennese with a picture that should hand down to posterity the representative of democratic America in the box of the Emperor of Austria.

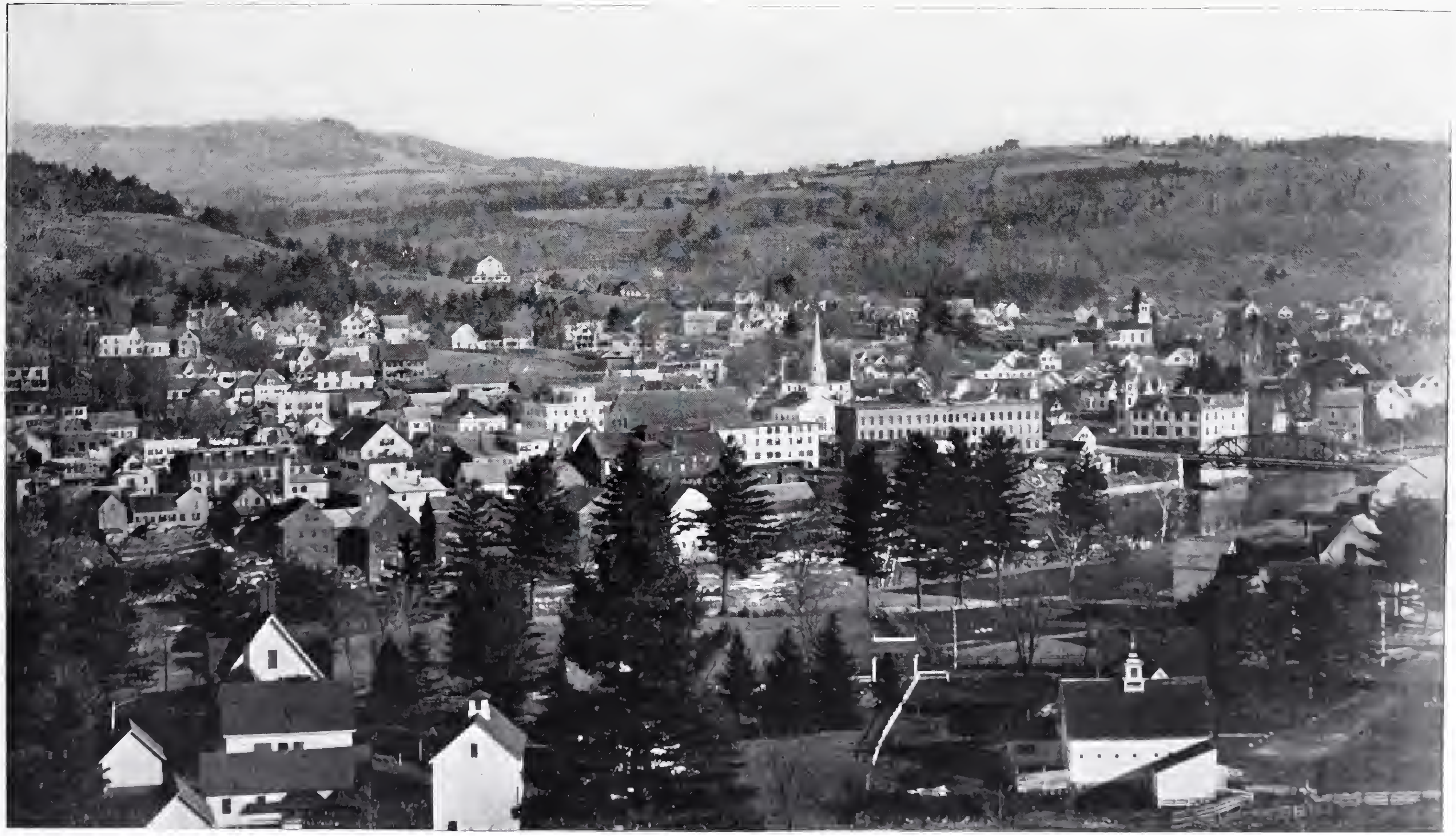
= = = = =

THE full page illustration of Littleton, N. H., made by the Hon. B. W. Kilburn, of that city, which we take pleasure in printing on the opposit page, is an example of rather unusually fine lens work. The distant hills are over three miles away from the camera, and yet the farm houses and barns on them appear perfectly sharp and well defined; while the detail of houses and yards immediately in front of the lens is equally clear and well rendered. This picture was made with the new Goerz patented lens, Series III, Number VII, and certainly is a great testimonial to the efficiency of this popular objective.

= = = = =

OUR next issue will contain an excellent article on the Gum Bichromate Process, by R. Demachy, illustrated with some fine specimens of the work of this renowned amateur photographer.

ARROW ARUM (PELTANDRA VIRGINICA) BY H. TROTH



VIEW OF LITTLETON, N. H

BY B. W. KILBURN

(Made with a Goerz Lens Series III., No VII.)

PRIZES FOR PHOTOGRAPHS OF SCULPTURE.

In connection with its exhibition in 1898 the National Sculpture Society proposes to form and display a comprehensive collection of photographs and other illustrations of sculpture and sculptured monuments in America. The scope of this collection will include commemorative monuments, memorials, statues, groups, reliefs, busts, original works in museums, and architectural monuments with sculpture. In order to stimulate interest in this feature of the Society's exhibition, a competition in photography, open to all photographers, amateur and professional, has been instituted.

A first prize of $50.00 in gold, and a second prize of $25.00 in gold will be awarded for the best photographs submitted in the competition. Diplomas of merit will be awarded for such other photographs as may be deemed worthy by the judges of the competition. All premiated photographs are to remain the property of the National Sculpture Society.

Awards will be made for general excellence of the photograph and the completeness with which the work of art photographed is shown, the artistic merit of the subject not being considered. Photographs must be mounted separately on card board 11 x 18 inches, or 9 x 11 inches, irrespective of the size of the plate. Framing is optional with the competitor.

All photographs must be signed with the name and address of the competitor, the name of the monument, statue or relief photographed, its location, and if possible, the name of its sculptor or designer. All exhibits must be delivered at the galleries of the building of the American Fine Arts Society, 215 Wast 57th Street, New York, on April 25th and 26th, free of all cost to the Society. Prints sent by mail may be delivered earlier, and must in all cases, contain stamps for their return. Framed exhibits must be sent to a consignee for unpacking, delivery to the galleries, and return after the close of the exhibition.

The exhibition opens on April 30th, for a period of two weeks, with the privilege of extension for a further time if deemed desirable. All photographs accepted for exhibition are subject to the general rules of the exhibition of the society, and may not be withdrawn during its duration. Exhibits will be promptly returned at the close of the exhibition. The galleries in which the exhibition will be held are ample for the display of a large number of prints, and every effort will be made to render this portion of the exhibition as attractive as possible.

The awards will be made by a committee of judges composed of two representatives of the National Sculpture Society, and two representatives of the New York Camera Club, with a fifth representative to be chosen by the first four.

As the object of the competition is to secure a representative collection of photographs of sculpture, competitors are reminded that groups, statues and monuments of sculpture that are little known and inaccessible, are as welcome as more conspicuous examples,

Entry blanks must be sent to the Secretary of the Society, Mr. Barr Ferree, 112 Wall Street, before April 1, 1898.

Charles I. Berg, Chairman.
I. Wyman Drummond.
Barr Ferree, Secretary.
Committee on Photographic Competition.

The competition has been arranged by a Committee consisting of Mr. Charles I. Berg, Chairman; Dr. I. Wyman Drummond, and Mr. Barr Ferree.

ORTOL.

BY ANDREW PRINGLE.

I have carefully examined and experimented with samples of a new developing agent called *Ortol*, furnished by Messrs. Fuerst Bros., and made by Mr. J. Hauff, Feuerbach.

As a stock solution of the reducing agent I used the following, recommended by Mr. Hauff—

Water	1000 parts or
Potash Metabisulphite	7.5 parts or
Ortol	15 parts or

Various alkaline solutions were used, but specially a five per cent. solution of Potash Carbonate, and a solution given by Mr. Hauff, as follows—

Water	1000 parts or
Soda Carb.	120 parts or
Soda Sulphite	180 parts or

I sometimes used the reducing and the alkaline solutions in equal proportions without addition of water, sometimes I added water in varying proportions.

My attention was in great measure directed to comparing this new developer with already well-known developers, such as Metol, Amidol, and Pyrogallol. I also watched carefully the effects of adding soluble bromides and stronger alkalies respectively to the developer, and I noted carefully the times occupied in developing the plates, first to the appearance of the image, and then to what I considered full density.

The point first noticed was that the color of the developed image with Ortol was rather ruddier or browner than with Metol or Amidol, it approached more the color of a pyrogallol-developed plate; this occurred more or less with every variation of development tried by us.

Plates equally exposed and developed side by side with Ortol and Metol and without bromide came up almost exactly at the same rate with these two agents, and the negatives, when finished, were practically the same in quality except for the warmer color of the Ortol images, But when bromide, even to the extent of half a grain to the ounce of developing solution was added the Ortol plate came up very much more slowly; one grain of bromide per ounce made the development about five times slower than without bromide. Yet the negative, when developed, did not seem to have suffered in any way from the prolonged development in cases of normal exposure; in cases of over-exposure the negatives were decidedly the better for the bromide, being clearer and somewhat pluckier than without the restraint.

I also find that the use of stronger alkalies with Ortol has a very marked effect on development, especially in cases where, with the carbonates, there is a tendency to thinness of negative. The result of using a caustic alkali in suitable proportion is to obtain a stronger negative, and the fogging effect of these caustic alkalies seems to be practically nil. I have repeatedly developed very sensitive plates with equal parts of Ortol solution and a two per cent. solution of caustic soda, and no bromide, and found no fogging effect. My experiments have been made on six brands of plates known on the market. The stock solution of Ortol given above has kept perfectly during the time I have observed it, several weeks. The mixed developer, whether with my 10 per cent. potash carbonate or the soda carbonate solution given above, can be used several times; the discoloration after one development is very slight.

In Ortol I find a simple, lasting, non-fogging developing agent, with an adaptability to circumstances distinctly ahead of any agent we have had since pyrogallol, and I believe that with a little more experience I should find it even superior to pyrogallol in "elasticity."

NEGATIVE IMPROVEMENTS.

BY W. ETHELBERT HENRY, C.E.

A too dense Negative can be easily reduced by immersion in hypo one ounce, water eight ounces, red prussiate of potash ten to twenty grains. The amount of the latter salt governs the rapidity of reduction.

A too thin Negative must, of course, be intensified. Many intensifiers contain mercuric chloride which is very undesirable. About the best intensifier is one introduced by J. B. B. Wellington, in which the intensification is due to silver nitrate and a pyro developer. It is made thus: Mix 100 grains of silver nitrate in two ounces of distilled water. Add to this solution 240 grains of ammonium sulphocyanide, which will form a precipitate which will ultimately be re-dissolved. On diluting this to ten ounces with water another precipitate is thrown down. Hypo must now be slowly added until the precipitate is just dissolved; the resulting mixture constitutes the stock solution. To intensify, take one ounce of stock solution and add sodium sulphate twelve grains, ammonium bromide two grains, ammonium hydrate six minims, and pyro three grains. Flow this over the wet negative and keep it moving until sufficient density is gained. More ammonia may be added if the developer prove not sufficiently energetic. This intensifier is capable of giving extreme density without fog, and a great advantage is that absolute freedom from hypo is not necessary.

Transparent Spots and Pinholes should be carefully filled with an opaque water-color diluted to match in depth the opacity of the surrounding film. "Photopake," introduced by the Vanguard Co., is most useful for this purpose as well as for blocking out objectionable backgrounds such as generally appear in photograms of machinery taken in sheds and fitting-shops.

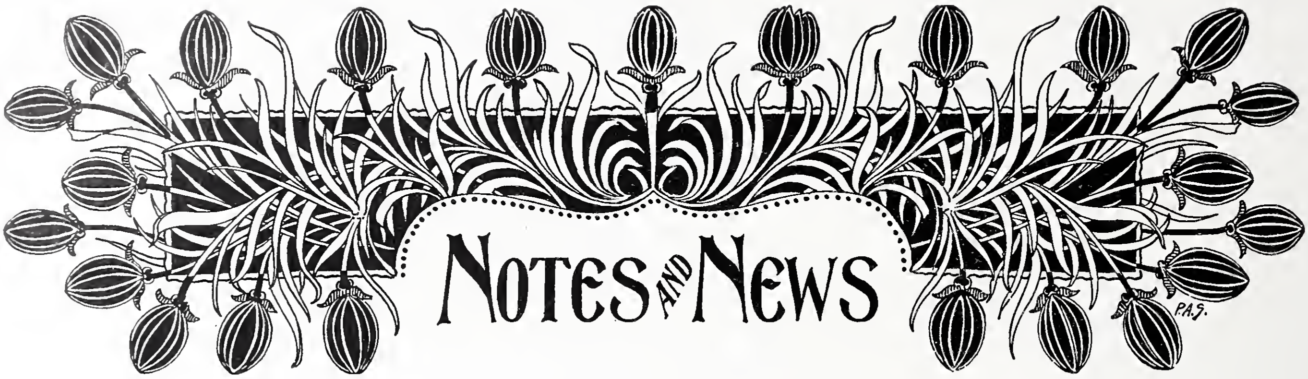
Cracked Negatives are difficult to print satisfactorily unless proper precautions are first taken. When the glass is cracked, while the film remains sound, the negative should be supported on a sheet of sound glass and immersed in a bath composed of hydrofluoric acid one dram, in water ten ounces. When the edges of the film begin to frill, let them be worked towards the centre of the plate and the film will be rapidly detached. The loose film can then be transferred to clean water and lifted out on a new sheet of clean glass. When dry it may be again washed, intensified, or reduced as may be necessary. As hydrofluoric acid attacks glass, and also the glass-like enamel of porcelain dishes, it is obvious that a papier-mache, ebonite, or varnished or waxed wooden dish should be used for the stripping mixture.

Scratched Negatives are a trouble to printers. If the scratch is on the film side, the only cure is to spot it as carefully as possible in order to fill up the clear part and make it print in accordance with the rest of the negative. If the scratch is on the glass side, it is still liable to show conspicuously in printing, but the following is a simple and effective plan of preventing any ill effect: The glass side must be made as clean as possible and the scratches must be freed from dirt. Then warm the plate gently and place it, glass side down, upon another piece of warm clean glass on the centre of which has been placed a few drops of thick Canada balsam. Place the plates on a warm slab of fire-brick or an iron plate and apply a gentle pressure until the Canada balsam exudes from the edges; then allow to rest until cold and firm. If the scratches are few and small they may be simply filled with Canada balsam (without using an extra glass) and thus become imperceptible.

Titles on Negatives may be put on in various ways, to print either in white or dark letters; in most cases the white letters are preferable. In a large business it would perhaps be well to use the "Nameit" rubber type, which is so arranged as to give a reversed impression on the film, which, in turn, prints correctly on the finished photogram. Another plan is to write the title backwards on the film in small block letters, using a fine pen and "Photopake;" while still another (which I have frequently adopted) is to have the title printed from type on clear tracing paper, cut them into strips and stick them face downwards on the film with a suitable adhesive. Another method, much more troublesome, but far neater in some respects, is to have the titles printed on fine white paper, and then photograph them on a reduced scale and make a transparency by contact. The transparency must then be coated with gelatine and collodion, stripped and cut into slips as required. A simpler method is to print the transparency on thin transparent celluloid film, which may be fastened to the negative film with fish glue.

Printing Dodges of various kinds hardly come within the scope of this series of hints, nor within the space at my command, so they must be held over until another occasion.—*The Photogram.*

Sunken in or Degraded Prints.—Very often one finds for some reason prints done by the above process when dried look dull and insipid. Sometimes this is caused by using the acid bath too strong, which seems to destroy the sizing used on the paper, with the not desirable result of the print showing signs of a most unbecoming bashfulness and trying to sink itself into the body of the paper support. When this is so a weak solution of the wax maglip will quickly coax the print back into the full light of day. It is a good plan to wash it on and let it soak well in, then dab it off with a clean cloth or blot it off with clean hard paper. This prevents any shiny appearance when dry.



NOTES AND NEWS

The Camera Club of New York will shortly enter into their new quarters.

The Illinois College of Photography, under the able management of L. H. Bissell, enters upon its fifth year of existence.

The Progress Medal of the Royal Photographic Society has been awarded to Messrs. Hurter and Driffield.

The Richmond Camera Club, of Richmond, Indiana, sends us a copy of their programme for 1898. This is evidently a go-ahead society.

We have received a copy of the illustrated catalogue of the First Annual International Salon and Exhibition of the Pittsburg Amateur Photographers' Society. It is a neat little souvenir, and contains some excellent reproductions of the prize pictures.

The Clinton County Camera Club. Early in March, 1897, a few students of the Plattsburgh State Normal School formed an organization to be known as the Clinton County Normal School. The club has grown rapidly, and now numbers over fifty active members.

The Second Annual Convention of the Photographers' Association of Wisconsin will be held at Milwaukee, Wis., March 8, 9 and 10, 1898. We have received a copy of the souvenir programme. It is neatly gotten up, and illustrated with some charming child studies by Mr. Geo. E. Thomas.

Walter G. Chase, who has contributed quite a number of excellent photographs to this magazine, has made the frontispiece and a number of very beautiful illustrations to Mark Twain's latest book entitled "Following the Equator."

Uncomfortably Frank.—She (pointing to picture on panel)—"There, my dear, is the result of my call on the photographer you recommended to me."

He—"Yes; I have been examining it."

She—"You surely do not call it a good picture, do you?"

He—"To be sure not, but that is not the fault of the photographer."—*Boston Courier.*

Norman Macbeth says: "Very few who have not received an art education see its importance, and many are apt to think that anything is a picture if it be taken from nature and successfully developed. Now a photograph in itself is not a picture, however accurately it may be focused. To constitute it a picture, it must not only have an idea and purpose, communicating a something to the person who sees it, it must have more, for a diagram or map may have all that. An essential qualification of the pictorial is the presence of beauty, sentiment, and feeling. These must be in it, according to the subject. To produce these the artist must possess those faculties of mind, or he will never see them in nature. and far less awaken them in others by anything he may do."

Practical Photography.—*Background an Important Feature of a Congressman's Picture.*

"I guess," said the Congressman, as he entered the photograph studio, "that I'd better let you take these back and try it over again."

"Didn't your photographs please you?" asked the young woman behind the show-case.

"Yes. They pleased me first rate."

"The likeness is remarkably good," she commented, as she held out one at arm's length.

"It is. If the resemblance were not so strong I might have kept them for my family and myself to look at. We would tell the neighbors it was somebody else, and have made them believe it. But there would be no use in trying to deceive them with that picture."

"What is it you object to?"

"The surroundings."

"But this is one of the most popular backgrounds in our gallery. Everybody understands that such things are only painted on canvas."

"No," was the reply, "everybody doesn't understand it. I wouldn't have one of those pictures get into the hands of the opposition just before election for $10,000. You'll have to give me some pictures with another background, even if I pay for having it painted to order. Look where you have me! Seated on a plush arm chair, in halls of Byzantine architecture, with a garden of palms in the background! It won't do. What I'll have to have is a perspective showing a barn and a hay wagon, with a hired man in the middle distance, while I stand in the foreground, with an earnest expression on my face, as if I were telling him exactly what we must do if we expect to save the country."—*Washington Star.*

To Obtain Duplicate Negatives Direct.—The usual exposure having been given, the plate is developed in the following solution until the image becomes visible at the back:—

Water	100 c.c.
Hydroquinone	2 grammes
Sulphide of Soda	5 grammes
Sodium hydrate	2 c.c.

By immersing the plate in a two per cent. aqueous solution of boracic acid the developing action is entirely stopped and the image partly fixed. After thorough washing, the plate is put in—

Bichromate of potash	1 gramme
Nitric acid	2 c.c.
Water	100 c.c.

This operation is conducted in daylight and continued until the image has turned a yellow red right through, when it is again well washed and placed in a solution of—

Sodium hydrate	0.5 c.c.
Water	100 c.c.

until it has entirely disappeared. The plate is now brought once more into the developer, the image now appearing negative, and when sufficient density has been gained, the negative is fixed in an acid fixing bath and finally well washed.—(*Photo. Chronik*, translated in *The Photogram*.

Moderation in Retouching.—"I remember once," said John Stuart, the coming President of the Convention, in the course of a lecture, "a famous photographer showing me the photograph of a lady and asking me to guess her age. In my innocence I replied, 'About forty.' 'Ah, well, you are wrong, Stuart, my boy, that lady is close on seventy!' 'Well, the more shame to you!' was all I could say. I do trust the time will soon come when the man at the camera will be the photographer and not the retoucher. Many now express themselves as dissatisfied that all the beautiful, natural, and characteristic markings of the face should be obliterated. Gentlemen let us have the truth; not the vulgar truth, but some semblance of it. The retoucher's work should never go farther than the toning down of the hardest lines, but not the entire obliteration of them."

Experiments on Commercial Albumen. M. P. Carles say: "The adoption of albumen as a clarifier by several industries has brought a number of different brands on the market; some can be used with every confidence, but, unfortunately, with a view to cheapen its production, there are also brands carelessly made, and, what is worse, adulterated. Some samples have been found to contain from twelve to twenty-five per cent. of insoluble coagulated matter, having no clarifying power whatever. Gum, dextrine, and gelatine are also used as adultrants. To examine the purity of albumen, 2 grammes should be made into a paste with distilled water, then more water gradually added, up to 200 c. c.; if the albumen be free from coagulated particles, the solution will be translucent. To 100 c. c. of this solution add 35 c. c. of a one per cent. solution of tannin, then 0·2 gramme of powdered bitartrate of potash. Shake well and filter. To 1 part of the filtrate add a few drops of a solution of 5 parts per 1000 of grenatine, and to the other a few drops of the tannin solution above mentioned. If there is no change, the albumen is pure; if the grenatine gives a precipitate, it shows that there is tannin in excess, and, therefore, that the albumen is either adulterated with some inert body, or has been over-heated in making. If, however, the tannin gives a precipitate in the last tube, it proves the presence of gelatine in the sample, as gelatine will precipitate, weight for weight, four times as much tannin as dried albumen can.—*British Journal of Photography.*

Development of Snap-Shots.—I have read and also hear a great many photographers say, remarks M. Rale in the *Echo Photograph*, that snap-shots can only be made in bright sunlight, or at any rate in exceptionally good conditions of light. I only refer, of course, to the use of cameras manipulated in the hand or on the ordinary stand, as these are in the most general use. Now for about two years, I have been able to make sufficiently rapid snap-shots ($\frac{1}{50}$ to $\frac{1}{100}$ sec.) *in all weathers*, but with a sky relatively not very dark, thanks to the use of the following developer:

SOLUTION A.

Distilled or boiled water	128¼ drams
Caustic potash	3⅜ drams

SOLUTION B.

Distilled or boiled water	128¼ drams
Metol	1¼ drams
Hydroquinone	1½ drams
Sulphite of soda	3⅜ drams
Potassium bromide	30⅔ grains

Take equal quantities of each solution to make the amount of developer required. This can be put on one side for further use, with or without the addition of fresh developer, according to the work to be done. This developer gives negatives of a good color, keeps a long time, and constitutes in somewhat experienced hands, a reducer as elastic as energetic. It can therefore be recommended without reserve.

A New Toning Agent.—The manipulation of Aristo Platino much simplified. The latest production of the American Aristotype Company.

"Aristo Single Toner" is a new toning agent, giving platinum black tones on Aristo Platino paper without the use of the preliminary gold bath. "Aristo Single Toner" combines the action of the gold and platinum baths formerly used in the manipulation of Aristo Platino paper. This production means a great deal to the fraternity. In the first instance, it is a great time and money saver, eliminating entirely one bath and one washing in addition to the monetary cost of the gold bath. Its second great advantage is the certainty of result. By the double toning process the preservation of the half tones depended, not only on the perfect working condition of the gold bath, but upon the judgment of the manipulator as to the extent that the tone should be carried in this bath. If bath and judgment were not right the light half tones would bleach or tone out. This is entirely obviated by the "Single Toner." Everything that is in the negative is saved in the print and the tone is uniform from the deepest shadows to the delicate half tone. Red spots are entirely avoided except under the most careless manipulation.

The gray-black tones secured by the double toning process cannot be produced by the "Single Toner," but the black and olive is secured easily and uniformly with high-lights strong and brilliant.

"Aristo Single Toner" is best adapted to aristo platino paper that is well ripened, or in winter from ten days to two weeks old. Like all other toning agents the best results are secured from negatives of sufficient strength to give reduction enough of silver to make a basis on which to tone.

As to the permanency of this toning agent, it is needless to go further than the reputation of the American

Aristotype Company for the production of permanent photographical materials and their well-known policy of placing on the market only well tested articles of known and unquestionable merit. "Aristo Single Toner" is now regularly on the market, and may be procured from all first-class dealers.

Testing for "Hypo" in Print Washing.—Mr. George Lurcock, in a communication to *Photographic Scraps*, suggests the usefulness of nitrate of silver as a test for "hypo" in wash waters; the addition of silver nitrate causing first a white precipitate of argentic thiosulphate $Ag_2S_2O_3$, which rapidly changes in color, through yellow and brown to black, but in the case of the minute quantity likely to be present in wash waters only a brownish or yellowish tinge must be looked for on adding a drop or so of silver nitrate solution. From a purely analytical point of view such color tests have obviously but little value, but as a means of practically watching step by step the gradual removal of "hypo" from prints or plates, the testing of each wash water by this method should have much to recommend it, as being far less subject to disturbing influences than starch and a soluble iodide or a permanganate. Obviously one or two soakings should be given after the reaction is no longer obtainable.

Photo-polygraphy.—Under this title Sobacchi describes a method which is very much like collotype on a flexible basis. A five to eight per cent. solution of gelatine in water should be made and poured into a flat porcelain dish, and white, strong, and, as far as possible, grainless, paper should be drawn through it, and the sheet allowed to set and dry, and then drawn through the solution again, and again dried. The prepared sheet should be bathed in a three or five per cent. solution of potassium bichromate, and then squeegeed down to a sheet of plate glass to extract excess of solution, and then stripped from the glass and hung up to dry in the dark. It should now be printed *under a positive* for half a minute in the sun, or about four minutes in the shade. The image should appear bright yellow on a brownish ground. It must be thoroughly freed from all bichromate, and then freed from excess of water with blotting-paper. The image will appear in relief, and the whole surface should be brushed over with a fairly concentrated solution of methyl violet or some other color to which a few drops of glycerine and sugar or glucose has been added. The excess of dye is removed with blotting-paper, and then a sheet of white paper is laid on the image and squeegeed gently down, when an image will be obtained. Sobacchi states that the *cliché* thus obtained may be used for years.—*The British Journal of Photography.*

A New Mercury Paper.—The formulæ and working directions given in *Photographic* are as follows: In a porcelain capsule place some metallic mercury, and cover it with nitric acid. After a few days a quantity of wet and crystalline nitrate of mercury will be formed, which should be removed and dried on blotting paper. For use take of the

Nitrate of mercury	15 grammes
Water	150 c.cm.

and if there is any residue on solution, add as much nitric acid as will dissolve it completely. On this solution float for two or three minutes, paper sized with arrowroot, then dry quickly and preserve in a calcic-chloride tube. Exposure is comparatively short, only two or three minutes under a negative of fair density, and development is by means of

Ferrous sulphate	4 grammes
Tartaric acid	4 grammes
Water	300 c.cm.

The image appears quickly, and when development is complete the print is fixed in

Chloride of sodium	6 grammes
Water	120 c.cm.

and after washing is dried. It has a gray color, which changes to black by toning with

Chloro-platinite of potassium	0.2 grammes
Tartaric acid	4 grammes
Water	200 c.cm.

"Sunlight and Shadow," by W. I. Lincoln Adams, has been reviewed, at greater or lesser length, in more than a hundred publications, including not only the photographic and art magazines, but also the more popular periodicals, literary publications, and the principal daily papers of the larger cities.

We have reprinted big extracts from a few of these reviews. The following, however, which appeared in the *Commercial Advertiser* of New York for December 31st, is so comprehensive and gives so excellent an idea of what the book really is, that we have made space for it entire, for the benefit of those of our readers who have not yet seen the book itself. The review is as follows:

"Not only the amateur photographer, but the artist himself, may take a few hints from Mr. Adam's book, for among the many illustrations it contains are some exquisite little landscape bits and not a few suggestions for figure pictures, well composed and artistically rendered, which merit serious attention. The author has culled his letter press from various sources, principally the magazines and periodicals appertaining to photography, and with judicious additions from his own pen he has made a readable volume, giving valuable advice of various kinds, which, if the amateur pay heed, will be of much aid in the results of camera work, no matter how trifling the effort.

The hopelessness of the subject generally chosen by the amateur is dwelt upon, and with reason. Indeed, while much may be learned from careful study, the man who has the knack of finding good subjects is, like the poet, born, not made. Such an accomplishment in the painter means success; its absence, if not failure, is at least a handicap in the struggle for the material side of things, or that which will purchase them—money. A good composition will excuse many faults of color and drawing. It will make a canvas stand out in an exhibition where it would be otherwise lost in the general shuffle. To make an invidious comparison, Leader, the well-known and popular English artist, is an example of what a man gifted in the art of composition may do with only a modest equipment in drawing and an almost utter absence of feeling for color. Yet his pictures are among the most popular and the most successful of modern English work, and they reproduce well in the black and white—always a test of able arrangement of line and mass.

In the matter of introducing figures in the picture, there is also valuable advice. One of the men quoted is Andrew Pringle, a well-known writer on the subject, who says that in ninety-nine cases out of a hundred the introduction of a figure in a landscape ruins it. "Before introducing the figure," says Mr. Adams, "the photographer should first of all consider, and very carefully, whether it is necessary and whether it will be an improvement." Gérôme used to say to his pupils that everything in a composition that was not absolutely necessary was a detriment. A picture here, called "A Wet Day on the Boulevard," by Alfred Stieglitz, is one of the wonders of modern photography, and shows how well figures do come in a composition when they are properly chosen. This particular picture is like a painting in its admirable lines and arrangement of men and women, cabs and accessories, while the reflections seem so delightfully in place as to be the work of afterthought and retouching, if such were possible. It is, however, a photograph from nature, over which the man dwelt with great patience and care, until at length he obtained the exact result he was after.

Some night photography will be found of unusual interest, the examples showing attractive results; while some photographs by J. Wells Champney show that artist to be familiar with all the possibilities of the camera in the arrangement of his model and the catching of happy effects of light and shade. The least impressive of the pictures are those of children at the end of the book, the work of a professional, clever enough in execution, but showing a preconception from which it is impossible to escape as one regards the half dozen examples.

Altogether the book is of much value to the amateur, and will make an attractive volume for his library, both for reference and to turn to when he is disgusted with the failures which come to those who not only "press the button," but who attempt to do personally that most fascinating part of the art—'the rest.'"

The Photographers' Copyright League.—There are now before Congress two bills to amend the copyright act. The Shafrath bill provides: "That a photograph, as such, made from any subject not a work of the fine arts, and not a part as illustration in any regularly issued publication which is duly entered at the postoffice at its place of publication, shall not be the subject of copyright at all."

The Hicks bill provides: "That a line production published in a daily newspaper, of a photograph made from an object not a work of the fine arts, shall not be considered as a violation of the copyright of such photograph."

The Shafroth bill denies to the photographer the right to protect his own creation by copyright, but gives such right to other publishers—presumably without his consent—and presents the anomaly of copyright on a REPRODUCTION while denying it on the *original* work.

The Hicks bill seeks to give to the daily newspapers the right to reproduce and print copyright photographs without payment or credit to the photographer who makes them.

Both these bills are so manifestly unfair to our profession that united action should be taken at once to defeat them.

The demand for our work for purposes of illustration in newspapers and other publications, great as it is to-day, is continually on the increase, and there is no good reason why it should not be paid for as well as other material.

The Photographers' Copyright League of America has for its object the protection of its members from unprincipled publishers, who will, unless resisted, take for their own use and without payment such photographs as they may think suitable for their profit and advantage.

It has already enrolled on its membership list many of the leading photographers of the country. It is prepared through its secretary and counsel to advise and instruct its members on the details of copyright, and to bring suit for infringement in their behalf whenever necessary, as well as to promote through its Executive Committee such legislation as may be needed to protect our interests. At the Annual Meeting, February 3rd, the By-laws were amended to read: "There shall be no annual subscription, but the working expenses of the League shall be met by voluntary donations," thus throwing open the benefits of the League to all who will subscribe to our principles.

While the League has now a most influential and representative list of members, its moral force and weight can be much strengthened if every man of note in the profession will associate himself with us. We, therefore invite every photographer who demands the right to say who shall own the product of his thought and skill to join us. This may be done by sending your name to the secretary with a request that you be enrolled in the League.

Meantime, the League is actively engaged in efforts to so modify the proposed amendments to the copyright act as will properly safeguard our rights.

B. J. Falk, Pres.
Geo. G. Rockwood, 1st Vice-Pres
Wm H. Rau, 2nd Vice-Pres.
S. L. Stein,
W. M. Morrison,
Louis Thors.
Executive Committee.

Chas. E. Bolles, Secretary,
241 Fulton St., Brooklyn, N. Y.

Trade Notes

Messrs. Fuerst Bros., of 17 Philpot Lane, London, England, write us that the price of the Lumière Cinematograph Camera for taking and projecting animated photographs has been reduced to £40 ($200).

The Lux Dry Plates.—From Mr. Chas. Schwake of 166 East 92d Street, New York, we have received some samples of Lux Dry Plates and Collodion Papers, manufactured by Messrs. F. Weisbrod & Co., of Frankford a/M. We have given these manufactures a careful test, and find them most satisfactory in every way.

The Cheyney-Hood Photo Supply Co. have purchased the business of Messrs. Wilson, Hood, Cheyney Co., and leased the five-story building at 1006 Filbert Street, Philadelphia. Having ample room and every facility in their new store and warehouse, they have decided to add to their business an Amateur Department. The department will be in charge of Mr. J. W. Allison, who will be pleased to welcome and to give every possible attention to all interested in photography. A thoroughly equipped dark-room for the use of amateurs and others will be constructed.

Mr. J. C. Millen has opened a house at 605 Sixteenth street, Denver, Colorado, to be devoted exclusively to the sale of Photographic Requisites, embracing apparatus, materials & chemicals. This house will be equipped for this purpose alone, handling no other class of goods, and customers can therefore rely upon an intelligent appreciation of their wants and the best of service to meet their demands.

The stock of apparatus will be complete in every particular, including the goods required by the professional as well as the amateur. The line will include the cameras of the Scovill & Adams Co. of New York, the Blair Camera Company of Boston, (for whom they will act as agents in this section of the country,) the Rochester Camera Company, the goods of the Eastman Company and other reliable manufacturers.

In materials they will be prepared to furnish as perfect an assortment of fresh goods as the demands of the local trade will allow, while special attention will be given to photographic chemicals. Of the latter they will carry in store at all times a complete supply, in both the commercial and chemically pure grades, to meet all requirements.

The Brilliant Developer, of the Barmen Dry Plates Manufactory Brune & Höfinghoff, Barmen, Germany. This new developer surpasses all others in covering power and cheapness, it keeps for weeks after use, and a surprising number of plates can be developed in the same solution before it is exhausted. With equal exposures and equal time of development it will give as an average three times more covering than any other developer. It is a liquid developer and ready for use after being mixed with an equal quantity of a 10 per cent. solution of carbonate of potash. It is very clean and discolors very little even when kept some time after use.

After extensive tests, comparing it with pyro, ferro oxalate, hydroquinone, metal, eikonogen, amidol, etc., etc., it has been ascertained that in using the Brilliant Developer as an average only one-third of the time of exposure is necessary, compared with the exposure required when developing with the other developers, which is an enormous advantage especially during dull weather. Thus much money, time and work can be saved on plates, which otherwise would have been lost by underexposure or the object having moved.

The price is very moderate and lower than of the most developers at present in use, as the same solution can be used over and over again by adding from time to time some fresh Brilliant Developer.

The success this new developer is having in Europe is simply marvelous, especially with professional photographers, who are, as a rule, so reluctant to try new materials. It has obtained a prize at the Berlin Exhibition for Photography, and scores of testimonials are arriving every week.

Formula.—Dissolve 1 ounce of pure carbonate of potash in 10 ounces of water.

Mix 1 ounce of Brilliant Developer with 1 ounce of the above potash solution.

If very soft negatives are required the proportion of potash solution may be increased.

If clearer and more brilliant negatives are required add 20 drops of a 10 per cent. solution of bromide of potassium.

For development of bromide paper, for which the Brilliant Developer is also particularly suitable, the following proportions are recommended:

Brilliant Developer	½ ounce
Potash solution	½ ounce
Water	1 ounce
Bromide of potassium solution	10 drops

This will develop a great number of prints. For softer results more water must be added.

The Scovill & Adams Co. of New York are the sole importers.

THE EDITOR'S TABLE.

A Reference Book of Practical Photography. By F. Dundas Todd. Price 50c. The Photo Beacon Co., Chicago.

Mr. F. Dundas Todd is well known as the editor of the *Photo Beacon*, and a talented writer on practical subjects. In this little work of less than 100 pages he has condensed more valuable matter than will be found in many volumes of a much larger size. We recommend it to all in need of a handy reference book.

Todd's New Astronomy. By David P. Todd, M. A., Ph. D., Professor of Astronomy and Director of the Observatory, Amherst College. Cloth, 12mo, 500 pages. Illustrated. Price, $1.30. American Book Company, New York, Cincinnati, and Chicago.

This new astronomy is designed to meet the present requirements of schools and students for a practical and scientific text-book in this important and most interesting study. Of the author's ability to write an ideal work on the subject, which should be at once simple, scientific, practical, and interesting, there can be no question. In addition to his former work in the United States Astronomical Observatory at Washington, and as Director in the Amherst College Observatory, he is well known to the public as leader of two solar eclipse expeditions, under the auspices of the United States Government, one to the west coast of Africa, and one to Japan, and as leader of another astronomical expedition to Japan, organized by Amherst College.

By placing more importance on the physical than on the mathematical facts of astronomy, the author has made every page of the book deeply interesting to the student and general reader. While mathematical results are given, the beauty and interest of the study are not obscured by unnecessary mathematical processes. Questions of universal interest, such as "Where does the day change?" "Where will the sun be overhead at noon?" "Where does the Southern Cross become visible?" "What are meteors?" "What is the difference between the sidereal and the solar day?" etc., receive special attention in the treatment.

The illustrations are an important feature of the book. Many of them are so ingeniously devised that they explain at a glance what pages of mere description could not make clear. They include scenes from the author's own laboratory and from his expeditions, diagrams especially invented for this book, and reproductions from photographs by Barnard, Roberts, and others famed in astronomical photography. The fine colored plates are a particular feature of the book, one of these, the frontispiece, being a reproduction of the color effects as seen by the author during the total eclipse of 1896 in Japan.

Chapters on the Natural History of the United States. By R. W. Shufeldt, M.D. Studer Bros., Publishers, New York. Issued under the auspices of the Natural Science Association of America.

This is a volume of 472 pages of text, the contents consisting of the following chapters: I. Methods of Study of Natural History. II. Classification of Animals. III. Some Interesting Insects, with Notes on the Class (Insecta). IV. Crayfish and Crabs (Crustacea). V. Sawfish, Rays, Sharks, and their allies, with Notes on Deep-sea Fishes (Elasmobranchii, etc.). VI. Sea Horses and Eels (Hippocampidæ: Anguillidæ). VII. Frogs, Toads, Newts, and other amphibians Amphibia). VIII. Some observations on Lizards (Lacertilia). IX. Protective coloration in Snakes, with other notes about them (Ophidia). X. Turtles and Tortoises (Chelonia). XI. Alligators and Crocodiles (Crocodilia). XII. Grebes, Loons and Auks (Pygopodes: Alcæ). XIII. Gulls and their allies (Longipennes). XIV. Pelicans and their relatives (Steganopodes). XV. Meadow Larks and Partridges (Genus Sturnella: Perdicinæ.) XVI. American Vultures (Superfamily Cathartoidea; Family Cathartidæ). XVII. Some of the Owls of the United States (Striges). XVIII. The Carolina Paroquet and other notes. XIX. The United States Cuckoos (Family Cuculidæ.) XX. Woodpeckers, Photographically and Pterylographically considered (Pici). XXI. The Cedar Birds, with notes on where birds lay their eggs (Ampelidæ: Turdus, Vireo, etc.) XXII. The American Warblers and Sparrows (Mniotiltidæ and Fringillidæ). XXIII. The Yellow-breasted Chat, Catbirds, and the Oven-bird (Icteria virens, Galeoscoptes carolinensis, and Siurus auricapillus). XXIV. The common Opossum and its kin (Didelphys virginiana). XXV. Whales and Manatees (Cetacea: Sirenia). XXVI. The Flying Squirrel and its relatives (Family Sciuridæ). XXVII. The Deer Mouse, with notes on other rodents (Peromyscus leucopus: Rodentia). XXVIII Bats and their habits (Chiroptera) XXIX. Museums and their uses, with some observations on Taxidermy. There are 130 beautiful illustrations.

Dr. Shufeldt is a valued contributor to THE PHOTOGRAPHIC TIMES, and the present number contains a most interesting article from his pen. No student or lover of natural history should be without this valuable and entertaining work. To the photographer it will be a surprise. The author's perseverance and unusual skill have enabled him to overcome one of the most difficult branches of photography, *i.e.*, the photographing at a short distance living specimens of wild animals.

ANSWERS TO CORRESPONDENTS

R. A. B., Independence, Wis. You will find full particulars of the color process in Prof. Gibson's article in this issue. The necessary screens are supplied by the Scovill & Adams Co.

L. L. H., N. Y. City. It is evident that you have over-developed your negative. You can reduce the density by immersion in a fresh solution of

Hypo	1 ounce
Water	4 ounces
Red prussiate of Potash	10 to 20 grains

until the right strength is attained, then wash thoroughly.

O. S., Chicago. The fading and mottling of your prints is evidently due to the impure material upon which you have mounted your print. Mounting on brown paper often gives a very artistic effect, but you must for this purpose employ the Platinotype or Carbon process. Silver prints are easily affected by the substances left in the cheap kind of paper. Hypo is one of them, used as an antichlor.

R. M., Hartford, Conn. Pyro stains can be removed from the hands by washing in a ten per cent. solution of oxalic acid, or sulphuric acid diluted with water in the proportion of 1 to 20, or a mixture of bleaching lime and citric acid.

A. R., Newburgh N. Y. The rapidity of a lens is dependent upon the relation the focus bears to the working aperture. A "rapid" lens is one which gives good definition without having to stop it down to any extent, and thus allows a large quantity of light to enter.

P. H., Philadelphia, Pa.—The principal cause why gelatine prints stick to the surface of the glass when enamelling is that the gelatine film was too soft when it was squeegeed to the glass. This often happens when the prints have been washed for a long time. An alum bath should be used or the prints should be allowed to dry spontaneously and afterwards immersed in cold water for a few seconds before squeegeeing to the glass plate.

T. A., N. Y. City.—"Rembrandt mounts" are manufactured by Messrs. Willis & Clements, and sold by all dealers. They are very effective platinotype for prints.

A. M., Washington, D. C.—So called magic pictures are made by fixing an ordinary silver print without toning and, after washing, bleaching in bichloride of mercury. The image disappears but can be revived by immersing in a solution of hypo, or ammonia. The picture can also be developed by blowing upon it the smoke from a cigar or cigarette. Special cigarette-holders were sold in Paris some years ago. A description and illustration of one of these will be found in "Photographic Amusements," published by the Scovill & Adams Co. The book contains particulars of a hundred or more other tricks in photography.

R. A., Seattle, Wash.—"The Encyclopedic Dictionary of Photography" will be published in complete book form in a few weeks. The price will be $5.00. As the edition will be limited it will be advisable to book your order now. This can be done at your dealers, or with the publishers direct.

S. S., N. Y. City.—The reason why the prints which you had made from your films have faded so rapidly is that as a rule very little care or attention is paid to the making of these. They are made in large quantities and often imperfectly fixed or improperly washed. The hypo salts left on the prints cause them to fade very rapidly.

L. C. H., Jersey City. We know of no good carbon tissue manufactured in this country. It is all imported from Germany and England.

P. O., Staten Island. The Stannotype process was a simplified method of Woodburytype, and was also invented by the late W. B. Woodbury. In place of the leaden mould, which required for its production an expensive hydraulic press, a relief was produced on glass by means of gelatine and bichromate. This was covered over with a thin sheet of tin-foil, and this was printed from in the same manner as in the Woodbury process. See "Stannotype" in the Encyclopœdic Dictionary of Photography.

M. S., Boston, Mass. A good liquid glue can be made by dissolving gelatine in acetic acid, which destroys its setting without destroying its adhesive properties.

F. O. A., Buffalo, N. Y. Black Japan is made with

Boiled linseed oil	1 gallon
Burnt umber	8 ounces
Asphaltum	3 ounces

Boiled together, and sufficient oil of turpentine to obtain the right consistence.

H. S. R., Albany, N. Y., Hillotype was the name given to an imaginary process for producing photographs in natural colors, by an American clergyman named Hill. The man was an impudent humbug who succeeded in obtaining a large amount of money for a book claiming to give full details of the process. The book contained nothing however but a lot of complicated formula of absolutely no value.

OUR COMPETITIONS

Competition No. 12.—Domestic Pets.

For the best photographs of domestic pets we offer:

First Prize—A Silver medal.

Second Prize—A bronze medal.

Competition No. 13.—Illustrated Cycle Routes.

For the best account of a tour with cycle and camera illustrated with not less than twelve photographs, we offer:

First Prize—A silver medal.

Second Prize—A bronze medal.

Competition No. 14.—Home portraits.

For the best photograph of a pretty American girl, made in her own home with natural surroundings, we offer:

First Prize—A silver medal.

Second Prize—A bronze medal.

RULES.

Rule 1.—All entries must be forwarded to Editor Photographic Times, 60 and 62 East 11th Street, New York, and marked "Competition."

Rule 2.—No indication of the competitor's identity to be placed on the competing pictures. A *nom de plume* (initials debarred) should be written on the back of the picture, and a sealed envelope containing the name and address of the competitor, together with a few particuars regarding the photograph and any other details of interest, should also be sent, upon the outside of which the *nom de plume* must be clearly repeated.

Rule 3.—The competition to be an open one. Any nnmber of pictures may be sent, but each one must be accompanied by another sealed envelope and a different *nom de plume* used in each case.

Rule 4.—All pictures for competition must be sent prepaid.

Rule 5.—The whole of the work entered must be the work of the competitor, that is to say, the exposure, development, printing, toning, mounting, retouching, and finishing.

Rule 6.—The prints must be mounted. Framing optional.

NOTES.

All the rules given must be strictly adhered to or the competitor will be disqualified.

Absolute discretion will be placed in the hands of the judge or judges, but we reserve the right to adjudicate on any question outside the actual judging.

Awards will be withheld if the judges decide that the work is not sufficiently meritorious. The possession of a Photographic Times Medal will, therefore, be a guarantee of a high order of merit.

The editor reserves the right of publishing reproductions of any of the photographs submitted.

No competitor shall receive more than one prize.

Pictures may be of any size or shape.

Any photographic process may be employed.

Pictures entered for competition will not be returnable.

The last day for receiving entries will be March 15th. The awards will be announced as soon after as possible.

THE PARTING PILOT BY F. W. ARNOLD

PATENTS OF THE MONTH.

GRANTED DURING THE MONTH OF JANUARY, 1897.
(FURNISHED FOR THE PHOTOGRAPHIC TIMES BY WILLIAM S. HODGES, PATENT LAWYER, WASHINGTON, D. C.)

595,865. **Lens Measure.** Wm. H. Reisner, Hagerstown, Md.

A lens measure is made up of an exterior casing, a graduated dial, and an inner casing, devices being arranged to move said inner casing with respect to the outer casing. Relatively fixed and movable pins are borne by the inner casing and superior and inferior hands are arranged to sweep over said dial independently. Mechanism for operating said superior hand is supported by the inner casing, the inferior hand being attached to said inner casing. The pins, mechanism and hands are so arranged that they all partake of the movement of said inner casing as a whole.

596,268. **Polishing Roll for Photographic Burnishers.** A. T. Humphrey, Kalamazoo, Mich.

A polishing roll for photographic burnishing machines, consisting of a tube provided on each end with a spindle or a journal containing apertures on the shouldered portion between the journal and the roll, said tube and spindle being made of a single piece of wrought metal.

596,312. **Photographic Background Carrier.** S. F. Badgley, Louisville, Ky., assignor to the Badgley & Hoerter Co., same place.

A flexible background-strip is wound on the rollers of a frame or carrier, and provided with a plurality of sections having contrasted shaded or scenic effects. A floor cloth is connected at one end with the lower section of the frame or carrier, and is provided with a plurality of sections corresponding to the sections on said strip. A plurality of strips are so arranged that each is attached at its upper end to the lower edge of one of the sections of the background-strip, the free edge thereof lying on said floor cloth.

596,687. **Kinetographic Camera.** Ernest Unger and Philip F. Krug, New York, N. Y.

A suitable frame is provided with means for guiding a film therethrough, a rectangular opening being formed in the frame in the rear of the film. A disk is arranged to revolve between the film and a suitable objective and provided with apertures capable of passing over said opening, the inner and outer border lines of said aperture being parts of circles passing substantially through the inner and outer corners of said opening, the connecting border lines being located so as to occupy approximately horizontal positions when passing over the central section of said opening.

597,268. **Photographic Camera.** C. A. Dake, F. P. Shepard and F. S. Peck, Edmond, Okla.

A back-plate of a camera is provided with transverse rearwardly projecting flanges and a plate holder is employed in connection therewith and provided with pins adapted to engage suitably arranged holes in said back-plate, whereby the plate holder may be shifted vertically or laterally to different positions on said back-plate, the parts being so arranged that the flanges aid in the shifting of the plate holder by guiding it laterally and limiting its movement beyond the proper point vertically.

597,440. **Stereoscope.** B. L. Singley, Meadville, Pa.

In connection with a lens frame and hood the inventor employs a shaft having its front end rabbeted so as to leave a transverse ledge for supporting the ends of the hood.

597,520. **Stereoscope.** W. A. Fried, Hamburg, Germany.

A rotatable supporting arm is pivoted to a suitable base and has a picture and lens support pivoted thereto. A segmental arm is fixed to said support and passes through an aperture in the supporting arm, a set screw being provided for clamping said segmental arm in any adjusted position with relation to the supporting arm.

597,788. **Photographic Background Carrier.** M. V. Shaff, Los Angeles, Cal.

The lower half of a vertical sliding device is made up of a horizontal base and vertical parallel guides, an antifrictional roller and cord-carrying pulley being located at the back and front, respectively, of the top of the lower vertical slide, the vertical bar and the horizontal bar at the top thereof with its hooks constituting the upper half of the vertical slide. A cord and weight are attached to the lower end of the upper half of the vertical slide, the cord passing upward thence within the lower vertical slide and over the carrying pulley so as to suspend the weight. A cam, spring, brake and treadle are attached to the lower half of the vertical slide and operate to retain the upper half of the vertical slide.

587,857. **Roll-Holding Camera.** E. P. Pasquier, Paris, France.

In a sensitized film photographic camera, a device is arranged for supporting the sensitized film, said device being located in a compartment at the back of the apparatus and comprising five rollers namely, a film carrying roller, an indicating roller provided with points, a receiving spool with means for engaging the end of the film and two guide rollers. The guide rollers are mounted in spring supports and provided with means for regulating the tension and pressure on the film.

TRADE MARK.

31,110. **Photographic Paper and Chemicals.** Nepera Chemical Co., Yonkers, N. Y., Chicago, Ill., and Paris, France. The representation of a Liebig potash bulb. Used since January 4th, 1894.

REMBRANDT EFFECT.—This name is given to a style of portraiture in which the shaded side of the sitter is portrayed with light more or less behind the head, and intended to resemble the great works of the celebrated artist of that name.

REMOVAL OF FILM.—The gelatine films may be removed from the glass plate by immersing them in a weak solution of hydrochloric acid. M. L. Mather recommends the fluorides of sodium and potassium for stripping the films from the glass plate. These alkaline fluorides, when in the presence of an energetic acid, such as sulphuric acid, liberate a small quantity of hydrofluoric acid. He first places the negative in a solution of the alkaline fluorides mentioned, for say three or four minutes, and then without washing immerses it in a 10 per cent. solution of sulphuric acid. A trace of hydrofluoric acid is thus produced in the film and the latter gradually detaches itself. To prevent expansion the negative should be previously soaked in a strong solution of chrome-alum and then well washed. The films on old and useless negatives are best soaked for some time in cold, and afterwards in hot water. They are then well rubbed with whiting. Wall recommends rubbing them with a paste composed of pumice-stone powder and glacial acetic acid.

REPEATING BACK.—A form of single plate-holder so arranged that two separate negatives may be made upon one plate. There are many forms of studio cameras with repeating backs, enabling the operator to take two cabinet or c.-de-v. pictures upon one plate. Repeating backs are also used for single stereoscopic cameras, with one lens only, the two negatives being made upon the one plate, the lens having been moved about two inches previous to making the second exposure.

RESIDUES.—The recovery of the unused gold, silver, and platinum used in photography is now practised by all who use large quantities.

Silver Residues.—It is well known that only about three per cent. of the silver used in sensitizing albumen paper remains in the finished prints; although it is not possible to recover the whole of the remaining 97 per cent., yet by careful practice about 80 per cent. should be saved. The following table, showing where the different losses take place, has been carefully compiled by MM. Davanne and Girard:

	Silver per cent.
Draining papers	1·028
First and second washing waters	52·860
Hypo bath	32·100
Washing water of fixed proofs	4·110
Cuttings and clippings	4·570
Remaining on proofs	3·100
Loss	2,232
	100·000

It will be observable that the greater portion of the silver is to be found in the first washing waters and in the hypo bath—nearly 85 per cent., so that it will well repay one to save these, if only a fair portion of the silver can be extracted.

Residues may be divided into three classes, *i. e.* :—

1. Clippings, cuttings, spoilt paper and prints.
2. Washing water used previous to fixing.
3. Old hypo baths.

Unless large quantities of paper are used, the first-class can be entirely abandoned if the unreduced silver is fixed out from the spoilt prints, etc. If they are saved, however, they should be stored away until a good quantity is obtained. They are then made into a pile, and burnt by setting fire to the top of the pile and allowing it to descend. The ashes are then collected and sent to the refiners, or, instead of burning, the paper may be beaten up to a pulp, with dilute sulphuric acid and strips of metallic zinc or copper placed in the mixture. Metallic silver is precipitated, and the zinc or copper is dissolved.

With regard to the second class of residues, the first and second washing waters only should be saved in a large tank or tub, and hydrochloric acid or common salt added, and the liquid allowed to settle. When the top is quite clear, the silver chloride will have settled to the bottom, and the liquid decanted or syphoned off. When a fairly good portion of the silver chloride is obtained, it should be collected, dried, and sent to the refiners.

The third class, *i. e.*, the old hypo bath, cannot, of course, be subjected to the same treatment, as the silver chloride is soluble in them, and would not precipitate. To reduce the silver from the fixing baths, the old solutions are kept separately in a tub or earthenware vessel, and some sulphuretted potash (liver of sulphur) added, which throws down the silver as a black deposit of sulphide Ag_2S. In this state it should be sent to the refiners. It can be reduced to metallic silver by roasting to free it from the the sulphur, and fusing. There are serious drawbacks to this process, however. The stench is abominable and injurious, and if free sulphur be left in, explosions are likely to occur when the mass is fused.

Davanne's method of recovering the silver from old hypo baths consists simply in immersing a plate of copper in the hypo bath, and letting it stand for about four days. The silver becomes gradually deposited upon the copper plate, whilst the copper is dissolved in the liquid. The copper plates are generally stood up on end against the sides of the tub, and are occasionally brushed with a stiff brush. The metallic silver will then settle gradually to the bottom, and when a sufficient quantity has accumulated it is filtered and washed. The filtrate, consisting of metallic silver and a little copper, can easily be converted into silver nitrate, slightly blue owing to the copper. If only a small portion of copper be present it will have no injurious effect; if a large quantity is detected, it can be thrown down as an oxide in the form of a black powder. The silver oxide should be added until the blue color has disappeared.

Instead of sending the residues to the refiners they can be all mixed together with nitrate of potash and charcoal, and fused in a crucible.

The silver bromide from old waste emulsion can be recovered by first melting and then adding a small quantity of hydrochloric acid, and boiling for a few minutes. The gelatine is thus destroyed, and is poured off, the precipitated silver bromide is then collected, and can be placed among the other residues.

The following processes* of recovering silvering waste may also be found useful:

I. *Photographers' Waste Bath.*—(1) Add solution of caustic potash or lime, as long as there is a brown precipitate; allow it to settle; pour off the liquid and collect silver oxide for reduction. See III.

(2) For 1 pound of silver add 1 ounce of sulphuric acid and one half pound zinc and allow it to stand two days. Precipitate as a chloride, wash eight or ten times by decantation, and dissolve gradually in nitric acid. Test the complete washing by hydrochloric acid. Wash with water till the zinc nitrate is removed. If zinc clings to silver, wash with hydrochloric acid.

(3) Suspend a sheet of copper in bath for two or three days.

(4) Acidify with nitric acid, precipitate as silver chloride by sodium chloride or hydrochloric acid, and reduce as III.

(5) Immerse in bath two strips of copper attached to a Daniell's battery. Silver deposited on the copper as in No. 3.

(6) Add sodium carbonate or hydrate. Reduce as in III. below, or, if pure enough, dissolve the precipitate at once in nitric acid.

(7) Concentrate bath made alkaline by sodium carbonate and add aqueous solution of oxalic acid neutralized with sodium carbonate. Filter, dry, and fuse with equal weight of sodium carbonate.

(8) Deposit either with or without a battery on iron. Fuse with potassium nitrate and sodium carbonate.

II. *Hyposulphite Bath.*—(1) Precipitate as silver sulphide by potassium sulphide. Reduce as III., or dissolve in nitric acid.

(2) Precipitate with hydrosulphuric acid and reduce as III.

(3) Decompose the hyposulphite by waste nitrosulphuric acid from manufacture of guncotton for collodion. Have silver sulphide and sulphur with sodium nitrate and sulphate in solution. Suspend zinc in the solution, then boil two or three hours; wash and filter, dry, fuse with borax and sodium carbonate.

(4) Suspend sheet copper in the solution

(5) Add hydrochloric acid, which sets free sulphur and precipitates silver chloride. Oxidize the silver by aqua regia and reduce silver chloride as in III.

(6) Add sodium hypochlorite to the alkaline solution. Wash precipitate, and fuse with mixed carbonates. This gives no fumes of sulphur. Sodium bisulphite and chlorides are by-products.

III. *Reduction of Silver Chloride, Oxide or Sulphide.*—(1) Mix with one-third its weight of colophony. Heat moderately in a crucible till greenish-blue flame ceases, then suddenly increase the heat, when a button of the metal is obtained.

(2) Melt with alkaline carbonates enough to cover surface from air; then mix with 75 per cent chalk and 4 per cent. charcoal and heat.

(3) Ignite with nitre on red-hot plate, carefully, and in small quantities to avoid explosions, run down to a bead with sodium carbonate and borax.

(4) If a chloride, reduce to an oxide by boiling with strong potash, then reduce by glucose, or boil the chloride with glucose and sodium carbonate.

(5) Add silver chloride dissolved in ammonia to a boiling solution of 1 part glucose and 3 parts sodium carbonate in 40 per cent. of water, keeping up the boiling all the time.

(6) Add to silver chloride sodium hydrate in solution and grape sugar, and expose to sunlight in an open dish with occasional stirring. Reduce to dark-brown oxide of silver soluble in nitric acid.

---

* From the "Scientific American Cyclopedia of Recipes."

(7) Mix with five times its weight of sodium carbonate. Fill a Hessian crucible half full and sprinkle sodium chloride over the top. Heat slowly in anthracite fire. After half an hour increase the heat until the crucible is white hot. When complete fusion has taken place, allow to cool and break out the button of silver.

(8) Fuse with 2 parts carbonate sodium and potassium mixed.

(9) Add pure zinc and dilute sulphuric acid and let it stand two days. Wash silver off with water acidulated with sulphuric acid and remove all zinc; finally fuse to a button.

(10) Mix with one-half its weight sodium carbonate and one-quarter its weight of dry, clean, sand, and ignite.

Platinum Residues.—Platinum is now largely used in photography, in the different platinotype processes and in platinum toning, and is a sufficiently valuable metal to repay the worker to save what he can of it.

The following remarks concerning the recovery of platinum residues, are given in Lyonel Clark's book on platinum toning: "The old toning baths, and the washing water the prints are passed through after toning, are especially rich in the metal, and these liquids should be poured into any bottle, and an ounce or so of the ordinary ferrous oxalate developing solution added. The bottle should be stood aside, and the platinum will be found to be rapidly thrown down in the metallic state. The major portion of the liquid is decanted off, and the residue filtered and dried, and can be sent to the refiners at once, or it can be converted into platinum chloride for subsequent conversion into chloroplatinite of potassium. In case any iron should be present, it is best to treat the filtrate with a fairly strong solution of sulphuric acid; this will dissolve out any iron in the form of the sulphate without injuring the platinum; the residue should be washed and dried and dissolved in aqua regia (nitric acid one part, hydrochloric acid, four parts), with gentle warming. As little aqua regia as possible should be used, only just sufficient to dissolve the platinum, as it has subsequently all to be evaporated off. The dissolution of the platinum should be conducted out of doors, or in a well-ventilated room, as the nitrous oxide fumes given off are most unpleasant, and rapidly rust iron or steel objects. The residue left after evaporation is chloroplatinic acid, and can be weighed, and at once used for the production of the chloroplatinite of potassium.

Gold Residues.—To obtain the gold from old toning baths, add sulphate of iron either in crystals or in solution. This will precipitate the gold in a black powder, which is well washed and dried, and then dissolved in nitro-muriatic acid, when a solution of gold chloride will be the result. This can be evaporated to dryness, dissolved in distilled water, and again evaporated to remove all traces of acid. Another way is to reduce the black powder in a crucible, but an enormous heat is required.

RESIN PROCESS.—See **Cooper's Process.**

RESINS.—A widely-distributed class of vegetable substances frequently obtained by making incisions in the bark of trees.

Most of the resins are soluble in anhydrous alcohol, and many in ether, sulphide of carbon, and oils; soften or melt at a moderate heat, and at a higher temperature burn with a smoky luminous flame.

Many of the resins are employed in the manufacture of varnishes for photographic and other purposes.

RESORCIN (Formula $C_6 H_4 OH_2$). Occurs in prisms, soluble in water and alcohol, and having a bitter taste. It is employed as a developing agent, its action being similar to its isomerides quinol and catechol.

RESTORING DAGUERREOTYPES.—Old and faded Daguerreotypes can be restored by cleaning and immersing in a dilute solution of cyanide of potassium.

RESTORING NEGATIVES.—Negatives which have been intensified with mercury are very apt to fade and lose their brilliancy. This can be restored by soaking the negative in water for about five minutes, and then immersing in the following solution:

Schlippe's salt	10 grains.
Water	1 ounce.

until sufficient vigor has been restored.

RESTORING PRINTS.—Prints when kept some time previous to toning will often turn yellow or brown, and become completely discolored. This may, however, be restored by placing immediately before toning in a two per cent. solution of strong ammonia. After toning they are washed in a bath of similar strength, and, further, about one part of ammonia is added to the fixing solution. With this treatment the whites of the prints should be completely restored.

Finished prints which fade by the action of light or by other influences can never be satisfactorily restored.

RESTRAINER.—Any substance employed in order to lessen the energy of the reducing or developing action of the chemical solutions upon the exposed film. If a plate has been exposed and it is immersed in an ordinary developer the effect would be that the image would flash up rapidly, allowing the operator no control over its density, and when finished it would have a very unsatisfactory appearance, owing to the absence of detail in the high lights and other defects.

The simplest restrainer is water added to the developing solution which naturally weakens its action upon the film. Another method is to tan or harden the film, with tannin or chrome alum, for instance, causing the gelatine to be less permeable to the developer.

The soluble bromides and the citrates of potash soda and ammonia are all used as restraining or retarding agents The following formulæ for restrainers are from Wall's "Dictionary of Photography."

The restraining power of the bromides of ammonium, potassium and sodium bear the following proportions to each other :

Bromide of ammonium 98 parts are equal to 119 parts of potassium bromide and equal to 103 parts of sodium bromide. Ammonium bromide is consequently the strongest, and potassium bromide the weakest, while the sodium salt ranks between the two.

The citrates of potassium, sodium and ammonium, have apparently quite a different action, for while the bromides prevent to a certain extent the excessive deposit on the high-lights, and permit the detail to make its appearance, the citrates, on the other hand, appear to prevent the detail from making its appearance, and permit the density to be obtained.

To make these restrainers the bromides are simply dissolved in water as follows :

Ammonium bromide	98 grains.
Distilled water to make	980 minims.

of solution, each drachm of which will then contain six grains of bromide of ammonium.

Potassium bromide	119 grains.
Distilled water to make	980 minims.

of solution, each drachm of which will contain 7$\frac{3}{7}$ grains of bromide of potassium, equal in restraining power to six grains of ammonium bromide.

Sodium bromide	103 grains.
Distilled water to make	980 minims.

of solution, each drachm of which will contain 6⅓ grains of sodium bromide, equal in restraining power to six grains of ammonium bromide, or to 7$\frac{3}{7}$ grains of potassium bromide.

Potassium Citrate Restrainer.

Citric acid	720 grains.
Potassium bicarbonate	944 grains.
Distilled water to make*	2½ ounces.

of solution.

Ammonium Citrate Restrainer.

Citric acid	720 grains
Liq. ammonia .880	630 minims
Distilled water to make	2½ ounces

of solution.

Sodium Citrate Restrainer.

Citric acid	720 grains
Sodium bicarbonate†	884 grains
Distilled water to make	2½ ounces

of solution.

These solutions will keep for an indefinite period, and can be diluted by adding five parts of water. The advantage of these last three restrainers is that when a negative shows plenty of detail, but refuses to gain in density, the addition of a little of one of the dilute solutions may be made, and the plate left for hours, if necessary, till the required density is obtained, without the slightest sign of fog. ‡

In the collodion process, the action of the developer is usually restrained by the addition of some thickening substance, such as sugar, gelatine, etc. The collodial restrainer introduced by Carey Lea has found considerable favor among photographers.§ It is prepared by first soaking an ounce of French glue in one and a half ounces of water, to which one drachm of sulphuric acid has been added. When it has swollen up thoroughly, the water is boiled until the glue is dissolved. Another half an ounce of distilled water is then added, and the boiling continued a couple of hours. Eighty grains of granulated zinc are next added, and the boiling again continued for another hour and a half. The solution is then allowed to settle, and the clear fluid decanted off. To every three ounces of a fifteen grain solution of iron used in the developer one minim of this solution is added.

---

* Or potassium carbonate 884 grains. † Or sodium carbonate (crystallized) 1,440 grains. ‡ E. J. Wall. § Capt. W. de W. Abney.

RETARDING AGENTS.—See Restrainer.

RETICULATION.—An effect sometimes observable on the collodion film when dry, and much resembling the pattern of crape. It is usually due to the solvents used in the manufacture of the collodion not having been sufficiently anhydrous, or it may be due to faulty pyroxyline.

RETOUCHING.—The art of retouching does not consist as is often supposed in making bad negatives into good, but in the perfection of good negatives. Under-exposed or over-exposed negatives will never give good results, however skilful the retoucher.

In landscape photography retouching should rarely be resorted to except in bringing up flat high lights, etc. Sometimes a negative can be improved considerably by coating the back with a matt varnish or pasting a piece of tissue paper to it and working lightly with a pencil or stump over the parts that are too transparent and by cutting out those parts that are too dense.

In portrait photography, however, retouching is almost an absolute necessity, as it is almost an impossibility to obtain truthful and satisfactory portraits by photographic means alone. We are well aware that one of the principal drawbacks in photography is its failure to represent colors in the same relative value as seen by the eye. In portrait photography, this defect is apparent to a considerable degree. For instance, fair complexioned sitters possessed of ruddy faces, come out dark, freckles appear as prominent black spots, pimples, blotches, wrinkles and facial lines often appear so exaggerated as to be positively objectionable, and alter the appearance of the sitter to a considerable extent.

The object of retouching is, briefly, to remove these effects by the judicious use of a sharply-pointed lead-pencil, without, however, destroying the likeness to the sitter, which many retouchers are apt to do.

For this purpose a retouching desk or easel is required, upon which the negative can rest firmly, and is lighted up with a reflector placed behind, so that the image can be properly seen by the worker.

The negative to be retouched is first varnished, and, when dry, the parts to be treated are dusted over with a little finely-powdered cuttle-fish. This is gently rubbed with the finger until the film has a rough appearance when viewed under a magnifying glass. Instead of this a retouching medium or matt varnish can be used.

The pencils used are usually very hard, Hardtmuth's or Faber's; HHH to HHHHHH are most suitable. The pencil should be sharpened into a long fine point, and then kept in order by occasionally rubbing on a piece of fine emery paper.

The transparent portions of the negative which give too dark a complexion on the positive can be filled up by careful stippling or interweaving pencil lines until they are brought into harmony with the surrounding parts. Pimples, freckles, blotches, etc., are thus removed, and the wrinkles and exaggerated lines softened down. This is what is termed smoothing the face.

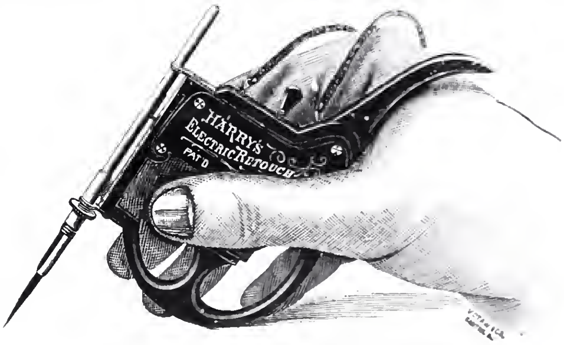


FIG. 386. HARRY'S RETOUCHING MACHINE.

The next operation is the most important one, however, and calls for the skill and considerable artistic knowledge of the retoucher. It is termed "modelling the face," and consists in bringing the high lights, semi-tones and deep shadows into harmony with each other in accordance with the artistic laws governing light and shade.

Retouching machines have been constructed. They work by electricity. The pencil is given a peculiar movement which takes the place of the stippling. A machine of this kind is shown in Fig. 386.

The art of retouching is one that requires to be learned under the guide of a competent teacher. The principal thing is to know, on examining an untouched negative, what to do, and what not to do. Many make the great mistake of over-retouching, removing all individuality from the portrait.

Always make a print from the negative to act as a guide during retouching.

On the subject of retouching, H. P. Robinson says :*

"A very little unskilful retouching will remove the texture of the flesh and leave that of stone ; will remove the expression of a living face, and leave that of a mask ; whilst the same amount of retouching applied with knowledge and intelligence would have retained the texture of the flesh, removing only the temporary and accidental blemishes and the exaggerations of photography which interfered with truth and beauty ; would have given fuller effect to a fine expression or subdued a suspicion of frowning or weariness by delicate touches applied in the right place. . . . . To know when to leave off should be the aim of the retoucher."

---

* "The studio, and what to do in it."

Chemical Retouching.—The principle of this method* consists in arresting the action of the developer on the parts of the negative which come up too rapidly. For this purpose, as soon as it is apparent that these portions are almost fully developed, the negative is removed from the developer, allowed to drain a moment, until there is no free liquid on its surface. Then all the portions where the detail is sufficient are painted by means of a camel-hair brush with a 5 per cent. solution of bromide of potassium. The gelatine absorbs this solution very rapidly, and the places may be gone over several times according as the detail is more or less out. The negative is then returned to the developer, and the development continued until the detail comes up in all portions of the negative. The development is nearly or quite arrested wherever the bromide was applied, and these portions do not gain in density. In the end a negative is obtained with detail throughout.

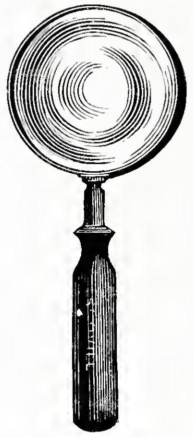


FIG. 387.—RETOUCHING GLASS.

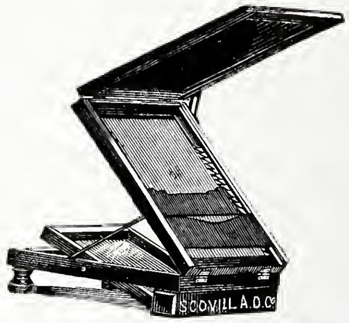


FIG. 388.—RETOUCHING DESK.

RETOUCHING DESK.—A desk or easel used in retouching the negative. There are many forms in the market. They all more or less consist of two frames and a lid, the bottom frame resting on the table holds a movable mirror, used to reflect the light to the underside of the negative ; to the front of this frame is hinged another frame, containing a piece of ground glass, on which the negative to be retouched rests, and which opens to an angle of about 30 to 45 deg. On the side farthest from the retoucher is hinged a light lid of wood, opening to nearly a right angle with the frame, on which the negative is retouched. This serves to shade the extraneous light from the eyes of the sitter, and can be supplemented with curtains on each side.

Instead of the mirror and ground glass, a sheet of white paper will often answer quite as well. A sheet of brown or black paper, with a small hole cut in it, can be placed over the negative to shut out all light except where the retoucher is working. This effectually prevents an excessive glare to the eyes, and gives greater brilliancy to that portion of the negative being worked on.

RETOUCHING GLASS or large magnifying glass, used when retouching, to better examine the negative.

RETOUCHING MEDIUM.—A kind of matt varnish rubbed or coated on the negative previous to retouching. It gives a biting surface for the pencil to work on. Two formulæ are—

No. 1.

Gum dammar	10 grains.
Canada balsam	5 grains.
Turpentine	1 ounce.

No. 2.

Shellac	75 grains.
Mastic	75 grains.
Sandarac	126 grains.
Ether	3 ounces.

Dissolved, and add

Benzole	4 drachms.

M. Piquepe's retouching medium is the following :

Dammar resin	240 grains.
Oil of turpentine	10 ounces.

REVERSAL OF THE IMAGE.—This is a term applied to the phenomenon resulting in a reversal of the image; those parts which should appear light becoming dark, and *vice versa.* Complete reversal of the image would result in a perfect positive instead of a negative.

If a photographic dry plate be exposed for a considerable length of time to the image, solarization takes place, resulting in a complete or partial reversal of the image. See **Solarization.** The addition of some of the thio-carbamides to the developer will result in a positive being obtained instead of a negative as usual.

---

* G. Mareschal, in *Photo Gazette.*

The author has obtained some fairly good positives by under-exposing the plate, and developing with the ferrous oxalate developer as far as possible. A small quantity of fixing solution (sodium hyposulphite) is then added to the developer, and the developed negative immersed in it. In a short time the reversal of the image will be complete, and a positive is obtained.

REVERSE ACTION OF LIGHT.—See Solarization.

REVERSED NEGATIVES.—Negatives with the image reversed in position as regards right and left. In photo-mechanical printing this is a necessity, otherwise the prints finally obtained would be incorrect, the right side being to the left, and *vice versa*. Reversed negatives can be made in several different ways. These can be divided into three different classes: First, reverse negatives obtained direct in the camera; second, negatives reversed by removing and reversing the films of the negative; third by reproduction from other negatives.

The simplest method under the first class is to photograph the image upon the plate reversed in the camera. To do this the back of the dry plate must be thoroughly clean, and also one should be selected having a perfect glass support, free from bubbles or other defects. The dry plate is then inserted in the dark slide, film side down, or the opposite to the usual way. A little care must be taken that the spring used for keeping the plate into position has no injurious effect upon the film. After focusing, the back or front of the camera is moved so that the distance between the lens and the screen is decreased exactly the thickness of the dry plate.

The next method of making reversed negatives direct in the camera is by means of a silvered reflector. Metal or glass silvered on the external surface should be used. The accompanying sketch, Fig. 389, will show how it is arranged: E is the camera, L the lens, A C B D is the section of a hood fitted round the lens and attached to the camera, A B is a mirror, as described, fitted at an angle of 45 deg. with the axis of the lens, and so arranged that the center of the mirror is its continuation, D is a small door which can be opened and shut at will. The camera is turned sideways towards the object, and a little consideration will serve to show that the image obtained on the focusing screen and upon the plate will be reversed.

In the third method of the first class a right-angle prism is used fitted on the lens. See Fig. 390.

On reference to Fig. 390 the system will be seen at a glance. The prisms are made of one solid homogeneous mass of glass with silvered hypothenuse.

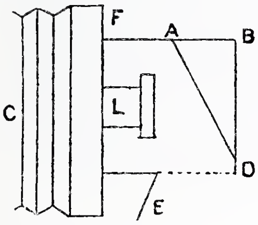


FIG. 389.—MIRROR FOR REVERSING.

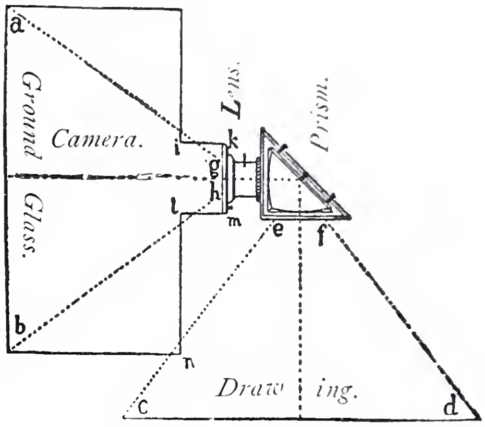


FIG. 390. PRISM ARRANGEMENT FOR REVERSING.

Of the second class, *i.e.*, negatives reversed by reversing the film, the most convenient method is the following: The negative is made in the ordinary way upon a gelatino-bromide plate. It is then washed and dried and coated with a solution of indiarubber dissolved in benzole, and when this coating is dry it is flowed over with transfer collodion, composed of—

Methylated spirit (.805)	2 ounces
Methylated ether (.730)	1 ounce
Pyroxyline	24 grains
Castor oil	24 minims

When this is dry the negative treated in this manner is immersed in—

Water	50 ounces
Hydrofluoric acid	½ ounce

The film should next be cut round the edges with a penknife and stripped away gently, and floated off into a bath of clean water to wash. A glass plate is then coated with a warm solution of gelatine (about five grains to the ounce), and the film floated on to it in the reverse position—that is to say, with the collodionized side downwards—with a soft squeegee it is pressed into contact with the glass, and then set aside to dry.

The best class of processes for producing reversed negatives is by reproduction. There are several methods. The powder process is very often employed: this will be found described under that heading. Bolas's method is as follows: A dry plate is soaked for five minutes in a four per cent. solution of potassium dichromate, rinsed once or twice with water, and then dipped into a bath of equal parts of methylated spirit and water, the superfluous mixture blotted off and dried. All these operations must be conducted in the dark-room. It is then exposed, under the negative to be reversed, to sunlight for three or four minutes, when a faint delicate image will be seen impressed; it is then washed and developed with ferrous oxalate or alkaline pyro, and fixed and washed as usual. The result is a reversed negative image.

Now that sensitive bromide negative films are made so perfect, there is no doubt that they will be largely used in obtaining negatives required to be reversed, as they can be printed from either side with the same effect.

REVERSING BACK.—A very useful arrangement in many modern cameras. It is well known that the different sizes of photographic pictures are always longer one way than another. In landscape Photography one is often confronted with the difficulty of deciding whether the picture would have the best appearance vertical or horizontal. In the case of photographing high buildings, too, it is often difficult to tell whether they would be all included on a horizontally-arranged plate. In the common forms of camera, without the reversing back, it is necessary to unscrew the camera from the baseboard or tripod, alter its position from horizontal to vertical, or *vice-versa*, and re-adjust. This operation naturally involves considerable time and trouble. With the reversing back, however, the camera is made square instead of oblong, and that portion of the back which holds the focusing screen, and the grooves in which the dark slide fits, is so constructed as to be readily detached. It can then be turned round from one position to the other, and sprung into place in the space of a few seconds only. Although with this arrangement the camera is somewhat bulkier and slightly heavier, yet these drawbacks are fully balanced by the additional convenience it affords. See also **Revolving Back.**

REVOLVER CAMERA.—A small instantaneous camera made in the form of a revolver.

REVOLVING BACK.—A method of reversing the back by revolving it. See Fig. 391 and **Reversing Back.**

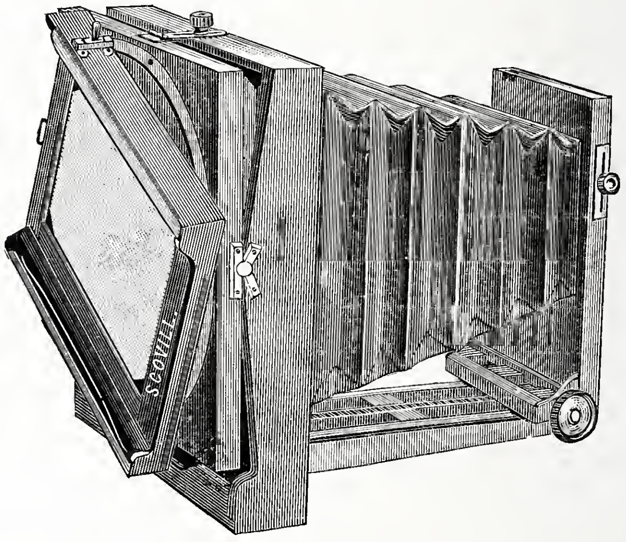


FIG. 391.

REVOLVING BACKGROUND.—A circular graduated disc revolving on a pivot attached to a stand. It is used in portrait photography, placed behind the sitter, and revolved until the correct light and shade effect is obtained.

RISING AND MOVING FRONT.—A movement now arranged in nearly every camera. It consists in constructing that portion of the front of the camera to which the lens is attached in such a manner that it can be raised, lowered, or moved to either side, and by means of clamp screws adjusted in any position. This movement is especially useful in making pictures of architectural subjects; by shifting the position of the lens a picture is often obtained difficult or undesirable to get in any other way.

RIVE PAPER.—A very fine class of paper manufactured at Rive-de-Gier, or simply Rive, a town of France in the department of the Loire. It is of a very fine and even texture, and is largely used for photographic purposes.

ROCKER.—An arrangement for keeping the dish rocked during the progress of development.

ROLLER SLIDE.—See **Roll Holder.**

ROLLER SQUEEGEE.—A wooden revolving roller attached to a handle and coated with indiarubber. It is used for mounting prints, or for squeegeeing gelatine prints upon glass. For the latter purpose, however, the straight edge squeegee is preferable. They are also made with two rollers. See **Squeegee.**

ROLL HOLDER OR ROLLER SLIDE.—An arrangement for holding a continuous band of paper or other flexible substance, coated with a sensitive emulsion, in the camera during exposure. The first roller slide was introduced by Mr. A. Melhuish, about the year 1861, and was used for making paper negatives.

In the usual roller slide the film is unwound from one spool in equal lengths corresponding to the size of the plate for which the holder is designed, and after it has received the exposure it is again wound on to another roller termed the clamping reel. In this manner a large number of exposures can be made upon a long band of paper or film, and this is then cut up, and each picture developed.

It is exceedingly compact and very light. When a perfect flexible film has been discovered, the advantage over glass plates will be incalculable.

The best form of roller slide is that known as the Eastman-Walker roll-holder It is constructed in three parts, a body consisting of four side, together with the top and bottom These latter are held to the body and together by two simple springs which pass down the ends, and by a mere pressure of the finger the roll-holder can be taken apart instantly, and its contents got at in all directions. Inside the body are fitted four rollers, two being small and permanent, and merely form runners for the film to pass over in its passage between the spool-holders. The other two are large rollers, fitted to attachments screwed into the sides of the frame. They are easily removable, and one fits on to an attachment provided with a brake, which serves as an automatic tension, keeping the film stretched flat and smooth, and prevents it being too freely unwound. There is also an audible and visible indicator, enabling the operator to be perfectly assured, both by sight and sound, that each exposure has been correctly wound off, and a new length placed in position ready for the next exposure. The film is also marked with an automatic perforator, so that no error can be made in cutting up the paper previous to development.

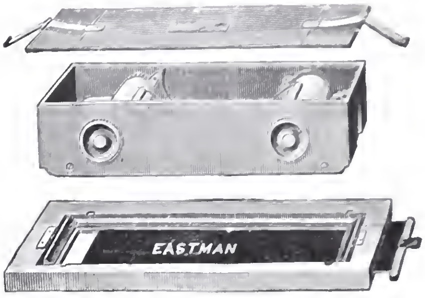


FIG. 392.

This roll-holder, although occupying the space of three double dark slides, contains sufficient material to make 50 or more exposures.

It can be easily adjusted to any ordinary camera, care being taken that the position of the film coincides with the plane of the focusing screen.

ROLLING PRESS.—A contrivance for flattening and giving a finishing surface to photographic prints, either mounted or unmounted. They are made either with two polished steel rollers, between which the print passes, or with a roller and a polished steel plate. The steel plate upon which the cards are laid is often so arranged that it can, if necessary, be heated with a gas or spirit lamp. By this means the cards are given a uniform and highly finished surface, similar to that obtained by burnishing. The pressure of the roller upon the steel plate should be perfectly even and under the control of the operator.

ROSE TAP.—A tap fitted with a rose similar to that used for ordinary garden watering-cans. The water comes out as a fine spray from the number of holes contained in the rose. It is very useful for washing negatives and prints, as the water running direct from the tap as a heavy stream will often destroy the gelatine film or the prints.

ROSIN.—See **Resins.**

ROTTEN STONE.—A mineral found in Derbyshire. It is reduced to a fine powder, and used for polishing metals, Daguerreotype plates, etc. For the latter purpose it should be sifted through fine muslin.

ROUGE.—Red oxide of iron. It is used for polishing metal, glass, etc. Daguerreotype plates should not be polished with it, however, as the iron clings to the silver and injures the tone of the picture.

R. R. LENS.—An abbreviated term for a rapid rectilinear lens.

RUBBER FINGER STALLS.—Finger stalls made of indiarubber are very useful when working with poisonous chemicals.

RUBBER STAMP.—Rubber stamps are now too well known to need any description. They can be made very useful to the photographer for numbering, naming, and marking negatives. For this purpose the movable reversed type should be used. A non-actinic ink is also necessary, and the name stamped backwards upon the film. If reversed type is unobtainable, the transfer aniline ink used in the gelatine copying apparatus should be used. The name, etc., is then printed on to a piece of paper, and when dry this can be transferred to the negative while the latter is still moist.

RUBY GLASS.—Ruby glass is usually obtained by the addition of sub-oxide of copper and a litle gold. It is used in photography as a non-actinic medium.

RUBY LIGHT.—See **Non-actinic Media.**

RUBY VARNISH.—See **Varnish.**

RUST SPOTS.—Rust spots sometimes make their appearance upon lenses, and may be removed by placing the spots in contact with chlorhydric acid diluted with a little water.

SAFE EDGE.—In carbon printing a thin strip of black or non-actinic paper pasted round the negative on the *glass* side is termed a safe edge. If the negative be masked on the negative side so as to print white, and should there be a heavy shadow in the picture coming against this portion, it is very likely to wash up in developing. The safe edge, however, prevents this.

SAL AMMONIAC.—See **Ammonium Chloride.**

SALICYLIC ACID (Formula, $C_7H_6O_3$; synonyms, *spinoylic acid*, *orthohydroxy-benzoic acid*).—A dibasic acid found in the flowers of the *spiræa ulmaria*, or obtained by heating sodium phenol to 180 deg. in a stream of carbon anhydride. It has a sweetish-sour taste, is slightly soluble in cold, more so in boiling water, and very soluble in alcohol and ether. It is principally used as an antiseptic and antiputrefactive agent.

SALT, COMMON.—See **Sodium Chloride.**

SALTED PAPER.—Paper prepared with a chloride. On sensitizing on a nitrate of silver bath, sensitive silver chloride is formed. Albumenized paper containing a chloride is sometimes termed salted paper, but the term is more generally applied to paper prepared for matt surface or plain paper prints.

SALTPETRE.—See **Potassium Nitrate.**

SALTS.—When an anhydride and a base are brought together they usually combine to form a salt, the distinctive properties of both being lost in the resulting compound.

All salts may be made to form an acid or a base, but they are not all neutral to test paper—for instance, carbonic acid is so weak an acid that it has not sufficient power to neutralize the alkalinity of the soda when it combines with it to form sodium carbonate, this being nevertheless a salt, however, as it has its acid and its base.

SALTS, HALOID.—Chlorine, bromine, iodine and fluorine are four elements which compose a natural group, the members of which are connected by the similarity of their chemical properties far more closely than those of any other group of elements.* They are usually termed the halogens, from their tendency to produce salts resembling sea-salt in their composition, such salts being called haloid salts.

SALTS OF TARTAR.—See **Potassium Carbonate.**

SANDARAC (Synonym, *gum sandarach* or *sandurac*).—A gum exuding from the *Callitris quadrivalvis*, one of the *cupressseæ* growing in Barbary, where it is called the Arar tree. Sandarac usually occurs in small whitish-yellow drops. It is a brittle, inflammable, resinous substance, with an acrid aromatic taste. Soluble in ether, alcohol, and benzol. It is used in making varnishes. About five per cent. is usually added to give more evenness to the film. If large quantities be used the varnish will be too soft.

SATIN, PRINTING ON—Prints may be made upon satin by treating with silver chloride in the same manner as with silk (see **Silk, Printing on**). Images may also be made upon satin stuffs by the diazotype or primuline process. See **Primuline Process.**

SATURATED SOLUTION.—When a solid is dissolved in a liquid, the first portions added may disappear quickly enough, but as more is added solution proceeds more and more slowly, until it ceases altogether, and any more of the substance added will sink to the bottom and remain there. The solution is then said to be *saturated*. See **Solution.**

SAXE PAPER.—A fine even textured paper, manufactured at Saxe, in Germany, and much used for photographic purposes.

SCARF CAMERA.—A small toy instantaneous camera hidden behind a scarf, the lens protruding through the latter, and made to represent a scarf pin.

SCENIC BACKGROUND.—See **Background.**

SCHLIPPE'S SALT (Sodium sulphantimoniate; formula, $Na_3Sb\ S_49H_2O$).—Obtained in fine transparent tetrahedral and very deliquescent crystals by dissolving sulphide of antimony in sodium hydrate and adding sulphur. Freely soluble in water. It is sometimes employed for the intensification of collodion negatives.

SCIAGRAPHY.—The act or art of correctly delineating shadows in drawing; the art of sketching or reproducing objects with correct shading.

SCRATCHES.—To prevent the negative from being scratched it is coated over with a protective varnish, which will preserve it to some extent. Accidents will often happen, however, and the films get scratched. They can sometimes be retouched with suitable color, or can be filled up with black or non-actinic color, so as to print as a white line in the positive picture, which can be better worked out with suitable color. If the glass side of the negative has large scratches on it they will usually show in the print. There are two ways of overcoming this difficulty. First, by moving the frame round during the printing operation, and second by cleaning the scratches and filling them up with Canada Balsam, slightly thinned with benzol, no traces will be discernable on the print, as that substance possesses nearly the same index of refraction as the glass.

---

* Bloxham's "Chemistry."

SCREEN, FOCUSING—See **Focusing Screen**.

SEALING WAX.—The term wax applied to this article is a misnomer, no wax being used but resin, which is essentially different in its properties. The best kind is made with shellac, the inferior sorts of common resin. The best red sealing wax is made by melting 4lbs. of light colored or bleached shellac with 1lb. of Venice turpentine and 3lbs. of Chinese vermilion. Golden sealing wax is made by using powered yellow mica or cat gold, instead of vermilion. Ivory black is used for black wax. An inferior kind may be made by substituting common resin for the lac, red lead for the vermilion, and common turpentine for that of Venice. A common black wax for bottles can be made with 6lbs. of black resin, ½lb. beeswax, and 5½lbs. lampblack.

SEED LAC.—When the lac is broken from the twigs and washed in water it breaks into small particles called *seed lac*. It is used in the manufacture of varnishes, and is more soluble in alcohol than shellac.

SEL D'OR.—See **Gold Hyposulphite**.

SELF-TONING PAPER.—A paper prepared principally for the use of amateurs and tourists It requires no special treatment to get an agreeable tone. The paper, after printing, is merely washed and fixed, when it takes a brown color instead of the dirty yellow obtained with ordinary paper thus treated. Only a brown tone, however, can be obtained. After fixing and washing the prints are laid between sheets of blotting paper, and afterwards dried under a hot iron. The hotter the latter the greater the brilliancy of the prints, although scorching must be avoided. A new self-toning paper has recently been placed upon the market, by means of which very good black tones can be obtained. The preparation is a trade secret.

SEMI-OPAQUE.—Half opaque and half transparent.

SEMI-TONES.—Half-tones.

SEMI-TRANSPARENT.—Half or imperfectly transparent.

SENSITIZE.—To render sensitive or capable of being readily affected by the action of light.

SENSITIZED PAPER.—This term properly includes any kind of prepared paper sensitive to light, the action being either visible or latent and made visible by development. It is more generally applied, however, to albumenized or plain paper treated with a chloride and afterwards floated on nitrate of silver. See **Sensitizing.**

Sensitized paper unless specially prepared will not keep for any length of time. That sold commercially is all prepared with acids as preservatives. The addition of 10 drops of perchloric acid to every ounce of the sensitizing solution is often recommended.

Ashman's method is as follows. The paper, when surface dry, is floated on one of the following solutions properly made up and filtered :—

No. 1.

Picked white gum arabic	$\frac{8}{4}$ oz.
Rochelle salts	1¼ "
Distilled water	20 "

No. 2.

Picked white gum arabic	$\frac{8}{4}$ oz.
Tartaric acid	1¼ "
Distilled water	20 "

After the paper is dry it should be stored away in sheets of sodaic blotting paper (*q.v.*) No. 1 will preserve it for about a fortnight and No. 2 for several months.

SENSITIZER.—Any substance added or applied to a photographic material to increase or alter its sensitiveness to light.

SENSITIZING.—The operation of causing the albumenized paper to become sensitive to light. This is done by floating the surface of the paper already prepared with albumen containing a chloride upon a solution of silver nitrate. (See **Silver Bath.**) The albumen soaks up a portion of the silver solution, which combines with the chloride and albumen to form silver chloride and silver albuminate, these compounds, being sensitive to light, darkening rapidly by its action.

The operation of sensitizing must be performed either by gas-light or during the day in a room lighted with windows covered with yellow paper or fabric. The room should be kept scrupulously clean and free from dust, and be fitted up with a convenient arrangement for hanging the paper lines; or string stretched across the room with American clips strung along them will be found very convenient. The dish containing the sensitizing solution should be conveniently larger than the sheets of paper to be sensitized. It should be placed on the table as near to the window as possible to get plenty of light to work with. Over the bath should be fitted a few American clips to hold the paper by one corner, and at such a height from the bath that the bottom corner of the sheet is nearly touching the liquid in the bath; this prevents splashing in drawing, and also the formation of air-bubbles.

The bath is placed lengthways before the operator, and the silver solution poured in. With a thin strip of blotting paper the surface of the liquid is skimmed, removing any scum or air-bubbles.

The paper to be sensitized should neither be too hard and dry, nor too moist. In very hot and dry weather it is advisable to place the sheets in a cool damp cellar for some little time before floating.

The paper has now to be floated, prepared side downwards, upon the silver solution. This is done by first turning up a small portion of each corner of the sheet for convenience in examining and lifting it from the bath. Two diagonally opposite corners are now held with the thumb and first finger of each hand, and the sheet curved slightly inward. That part of the sheet nearest the left hand is lowered gently on to the center of the solution, and the sheet slowly drawn on to the solution, steadily lowering the right hand, until the whole sheet is floating in contact with the solution, with the exception of the four upturned corners.

If this method be followed no air-bells will form between the paper and the solution. After a little time the corners are gently raised and lowered again one at a time to enable the operator to examine the progress of the sensitizing operation. Any air bubbles visible should be removed before again lowering the corner on to the solution. If any of the solution should by accident get on to the back of the paper it should be blotted up at once with a piece of blotting paper. It often happens that the paper after floating will curl up, the corners and sides leaving the solution. The cause of this is that the paper is too dry; by breathing hard on to it the paper can be made to resume its position on the solution.

With regard to the correct time the paper should be allowed to remain upon this solution, this depends both upon the strength of the bath and the temperature of the solution and of the atmosphere. Further, different brands of paper often require different lengths of time for sensitizing, and it is also influenced by the character of the negative and the effect to be produced in the resulting print. Many operators sensitize their paper of different degrees of strength for the various negatives from which they have to print; for instance, for weak negatives, a paper sensitized strongly. The usual time, however, may be said to vary from 40 to 70 seconds in the summer, and from 60 to 100 seconds in the winter.

The correct time for sensitizing, as has already been stated, is dependent upon so many considerations that some amount of thought and experience is required by the operator to get the best class of results.

After the sheet has been allowed to remain for the required time upon the solution, it is slowly raised by two corners and drawn slowly over the edge of the dish, or preferably over a glass rod attached to one side of the dish. In this manner the superfluous solution is removed from the surface of the paper. Some operators prefer to do this by laying a sheet on a piece of bibulous paper, but unless this be perfectly pure and free from antichlor, the method is rather risky.

The sheet is next fixed at one corner to a clip, and at the opposite or lowest corner a piece of white blotting paper is affixed to absorb the moisture.

The drying of the paper is an important point. It should not be done spontaneously, as the silver solution will then sink into the paper, and the brilliancy of the prints is lost.

The sheet is first allowed to drain and become partially dry, and then finished thoroughly by heat in a drying cupboard fitted with a row of gas jets or a stove. In this the top of the sheet is attached to two clips. If it be found that the paper curls up in drying, pieces of wood the same length as the paper with a clip at each end are fixed to the lower edge of the paper to keep it straight.

The heat for drying should be diffused and sufficient to quickly dry the sensitized paper.

The following are the failures likely to be met with in sensitizing albumen paper, and the causes.

The paper repels the silver solution. It is too dry.

White spots are produced if bubbles of air are allowed to remain beneath the paper when floating. The corners should be lifted up as soon as paper has settled down and the air-bells removed.

Small drops of the silver solution termed "tear drops" adhere to the sheet when hung up to dry. They should be blotted off immediately, and are caused by the paper being too dry.

The paper discolors quickly if over-sensitized.

A dull and sunken-in appearance of the image may also be caused by over-sensitizing.

Bronzing of the dark shadows is also sometimes the result of over-sensitizing.

Poor, weak prints are usually produced by too short sensitizing. Greasiness of the paper is also produced either by insufficient sensitizing or by the solution being very cold. Unpleasant foxy-reddish tones of the prints are often caused by too short floating on the sensitizing bath.

The curling of the paper on the solution is caused by the paper being either too dry or the albumen film being too tough. Breath on the back of the paper until it lies down flat again.

Stains are sure to appear if the sheet is allowed to come in contact with any unclean substance.

Dark stains on the back are produced by the silver solution running over the back.

Small dark spots or specks are caused by small metallic pieces of dust imbedded in the paper. They can sometimes be removed with the sharp point of a knife.

Inequality in the prints is due to uneven sensitizing.

SENSITIZING BATH.—See **Silver Bath**.

SENSITOMETER.—An instrument for comparing the sensibility of various photographic sensitive surfaces. There are various forms, which are, however, all more or less imperfect. The reason of this is that a standard light is required, perfectly uniform, and reproducible at any desired place or time. A light of this description has never yet been found, nor has any means yet been devised of calculating the difference between an accepted standard and an actual light made as near to it as possible.

Warnerke's Sensitometer is the one generally employed in testing various photographic sensitive surfaces. It consists of a transparent scale of figures made by the Woodbury process, the transparency of the scale decreasing by regular degrees from 1 to 24. Under this scale the plate to be tested is exposed for a given length of time. Warnerke employs what he terms a normal light, that is, a glass pane coated with a phosphorescent paint. Before this, two-and-a-half centimeters of magnesium wire are burned, then the whole is left undisturbed a minute, when it is placed upon the scale under which the dry plate lies. This light is considered as always uniform, but this is not so, however, as the temperature has a very marked effect upon the luminosity of the phosphorescent paint, the mere warmth of the hand increasing it. Further, this instrument possesses the drawback of being unable to register small differences.

Taylor's Sensitometer.—In this a more perfect method of graduating the light that reaches different parts of the plate from a uniform source is employed by means of a series of varying areas of a uniformly illuminated surface. The apparatus first employed by Arthur Taylor, in 1869, consists of a box containing a series of short wide tubes, each of which was open below to the sensitive surface, and closed at the upper end with a diaphragm perforated with a certain number of exactly uniform holes. The intensity of the light acting upon the sensitive surface at the bottom of any tube is proportional to the number of holes in the cover at the upper end of the tube.

Vogel's Sensitometer is an improvement upon the previous one. The scale is formed by a metal plate with holes. This plate covers a wooden block in which twenty-four cylindrical cells are drilled. Above the first cell one hole is made, above the second two, above the third three, and so on. Under these cells, the plate to be tested is exposed in a dark-slide-like contrivance, and it is obvious that the relative clearness under the different cells must be in exact proportion to the number of apertures made above the respective cells. When, therefore, two plates are exposed equally long under this instrument before an object uniformly illuminated and then developed, it may be that one plate will show the effect of light up to cell number two (with two holes), and the other up to cell number four (with four holes). With half the strength of the light the same result was obtained with the first plate as with the whole strength in the second plate, and the first plate is therefore shown to be twice as sensitive as the second.

Mucklow and Spurge's Sensitometer.—This is also similar to Taylor's, except that the diaphragms have one opening each, the openings being made of the required sizes. It is obvious that when a developable film is being tested the light must be graduated, because a uniform effect cannot be secured (the time then being in inverse ratio to the sensitiveness), as the result is not apparent until development.

SENSITIVE.—Capable of undergoing change by exposure to light.

SENSITIVENESS.—The sensitiveness of photographic substances, films, plates, paper, etc., is determined by the amount of time required for a given quantity of light to impress itself upon them either visibly or rendered visible by after development. The sensitiveness of dry plates is usually calculated by means of Warnerke's sensitometer. This method is, however, far from being perfect, and although plates are often sold with the sensitometer number marked upon the box containing them, yet this cannot be taken as a sure guide to their rapidity of action, and the numbers are often more misleading than otherwise.

The sensitiveness of dry plates can be considerably increased by immersing them for from three to five minutes in a solution of 100 parts of alcohol ·805, one to two parts of a 1 in 15 solution of nitrate of silver, and ten parts of ammonia. They are then dried and used immediately.

SEPIATYPE.—A platinotype process introduced by Willis, giving sepia tones. See **Platinotype.**

SESQUICARBONATE OF SODA.—See **Soda Bicarbonate.**

SESQUIOXALATE OF IRON.—See **Ferric Oxalate.**

SESQUISULPHATE OF IRON.—See **Ferric Sulphate.**

SHAPES, CUTTING.—See **Cutting Moulds.**

SHEATH.—An arrangement for holding the dry plates in magazine cameras so that they are protected from the light and can be conveniently changed at will. They are usually made of darkened metal.

After a time sheaths will wear bright, and often in this state produce fog by reflecting light on to the plate. A little black varnish thinned with turpentine should be brushed over them. They are also very liable to rust. To prevent this rub them over with a little vaseline, applied with a rag. This has also the effect of making them work more smoothly when changing.

SHELLAC (Synonym, *gum lac*, *button lac*, *seedlac*).—A reddish-brown, fusible, brittle and inflammable substance occurring in thin sheets. Bleached lac occurs in white opaque brittle masses. These should not have a shiny appearance on the exterior, as this denotes that a change has taken place, and the substance will be found more or less insoluble.

Lacs are all soluble in alcohol, and in water containing borax, sodium carbonate, caustic soda, or ammonia. They are principally used in the manufacture of varnish. A shellac solution is not suitable for a varnish without the addition of sandarac or other suitable substance to give it the required elasticity.

If ammonia be mixed with an alcoholic solution of shellac the latter may be mixed with all proportions of water.

SHELLAC MOUNTANT.—Made by dissolving one ounce of shellac in four ounces of methylated spirits, and allowing to stand for some time, when the solution will be ready for use. Another method is to dissolve the shellac in a hot solution of borax and water, but the borax is liable to spot the prints.

SHUTTER.—For ordinary photographic work the lens is fitted with a cap which covers its front, and which is removed when making the exposure. For many classes of work, however, a shutter is necessary; for although it is possible to make a very rapid exposure by removing and replacing the cap as quickly as possible, yet it will be understood that exposures of 100th of a second cannot be possibly done in this manner. The shutter is, therefore, a mechanical arrangement to effect this, and a very great variety have been constructed. They may be divided into the following classes:

1. (*a*) The simple flap shutter. (*b*) The double flap. (*c*) The flap and drop.
2. The simple drop shutter.
3. The "go and return."
4. The roller blind shutter.
5. The diaphragmatic.

With regard to the first-class it may be stated that they are of little service for very rapid exposures, and that they give a longer exposure to the foreground than to the sky—an arrangement of great service at times when the contrast is very great, as it often is.

The simple drop shutter, when properly constructed, is capable of giving very rapid exposures, and is for this reason very often employed. It is usually a plate of wood, metal, or ebonite, which falls by gravitation in front of the lens. The center of the falling piece has an aperture of a certain length (see fig. 394) usually two or three times the diameter of the lens. Its rapidity can, of course, be increased by means of an elastic band or spring.

Of the "go and return" class there are two well-known forms, one of which works in the diaphragm slot and the other in front of the lens.

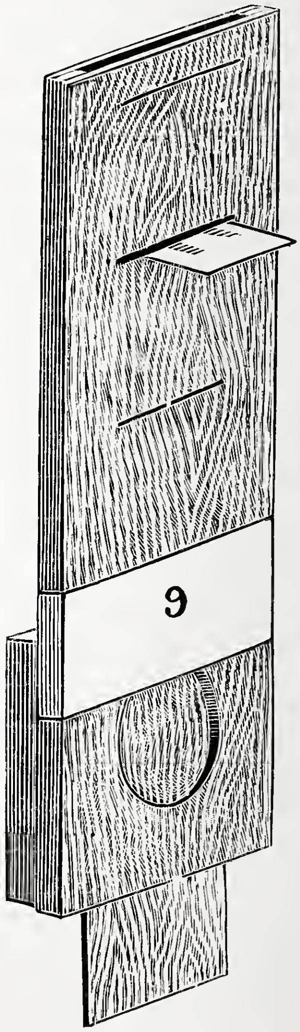


FIG. 393.—DROP SHUTTER.

These are more useful for prolonged exposures, but many, however, have a tendency to shake the camera when pushed to the utmost by the spring just at the critical moment when the lens is fully opened. The consequence is, of course, a blurred image.

The roller blind class includes several well-known and tried shutters. They are perfectly free from vibration. Many of them can be used both as time and instantaneous shutters.

The diaphragmatic class includes all shutters working between the lens combinations. One of the advantages is that the position of this shutter enables smaller moving parts to be used.

Shutters are usually set in motion by releasing a catch with the finger, setting the spring or weight into action. A better system, however, is that known as the pneumatic release. It consist of an indiarubber tube attached to a piston, and having at the other end a hollow indiarubber ball. By pressing the ball air is forced through the tube, causing the piston rod to release the shutter. By this means shaking camera is entirely avoided; the exposure can be made at any distance without exciting attention, and if the tube be long enough it is possible to photograph oneself, or be included in a group of one's own taking. The requirements of a shutter are thus summed up by Chapman Jones: "A shutter should be small, that it may not catch the wind, light, that it may not strain the lens mount or camera front; simple that it may be easily repaired by the user, quickly fixed to or removed from the lens, and need no change whatever in either the camera or lens."

In order that the shutter may be used intelligently, it is necessary that the lengths of exposure given by it should be accurately measured. This is usually done by photographing a body, falling at a known rate, and measuring the length of the impression. A simple plan is to have a large black circular disc, having towards its edge a white clearly-defined spot. This disc is revolved at a given speed—say, one second per each revolution. An exposure is made with the shutter, and on development the length of the image is calculated—if it has moved, say ten degrees of the circle, the exposure given by the shutter was the $\frac{1}{36}$ of a second. It is important that the image of the moving object be as near to the center of the plate as convenient, as the edges usually get less exposure.

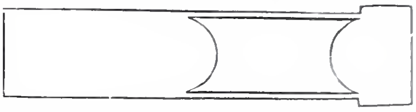


FIG. 394.—APERTURE OF DROP SHUTTER

M. T. D. Tissandier has devised a simple apparatus which is still more effective. This apparatus consists of a rotating disc of some white substance having its face smoked to blacken it, and a spring attached to the disc, the end of which is a fine needle having a slight pressure upon the disc sufficient to remove the black coating. The spring is put in motion by the leves at the bottom shown in Fig. 395. To measure a shutter the instrument is set up facing the camera in a strong light—sunlight if possible—the lever is worked and the spring commences to vibrate. The disc is then set in motion and the result of a short exposure is shown in Fig 396, the needle attached to the spring making the curves as shown. If the speed of vibration of the spring and the rotation the disc be known it is easy to calculate the speed of the shutter by the length of the sinuous lines which were photographed on the plate. If, however, the time of exposure be greater than that required for the disc to make one revolution, it is not a difficult matter to so modify the instrument that it will record the exposure in the form of a spiral as shown in Fig. 397.

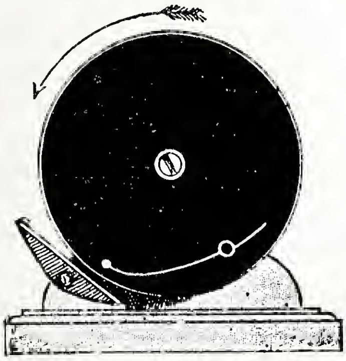


FIG. 395.

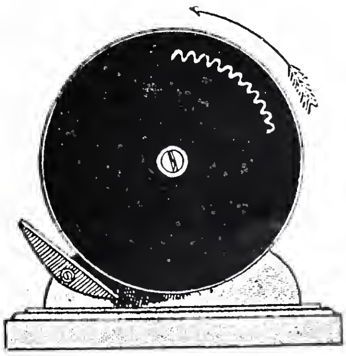


FIG. 396.

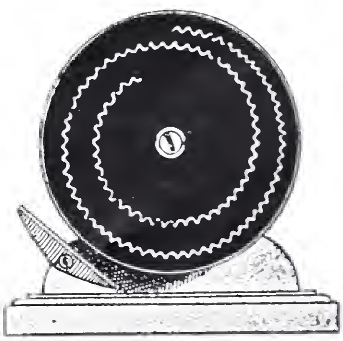


FIG. 397.

Another apparatus has been devised for this purpose by Addenbrooke. A sensitive plate is caused to revolve at a given speed behind a small opening made in an opaque screen, in front of which magnesium ribbon is burnt. The shutter is fixed between the light and the aperture of the screen. The proportion that the curved line of the developed image bears to the whole circle is the proportion that exists between the time of one revolution of the plate and the exposure given by the shutter. For example, if the plate makes one revolution per second, and a tenth part of a circle is produced on development, it is apparent that the duration of time the light was admitted was the one-tenth of a second.

In photographing moving objects it is useful to know the maximum amount of exposure that can be given at different distances. The following calculations of W. Groves* will enable one to do this satisfactorily :—

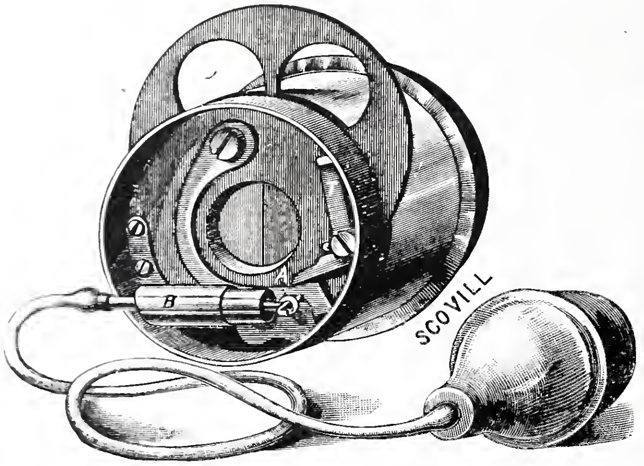


FIG. 398.

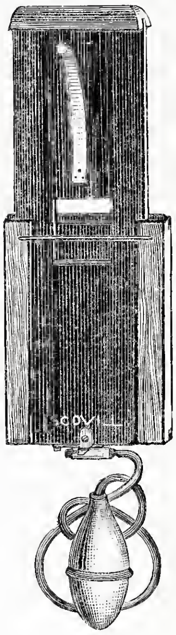


FIG. 399.—DROP SHUTTER.

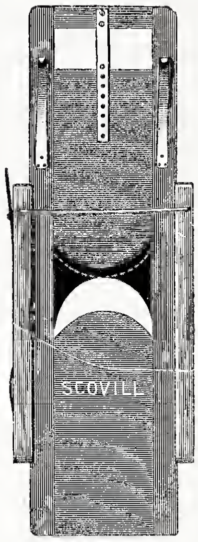


FIG. 400.—DROP SHUTTER.

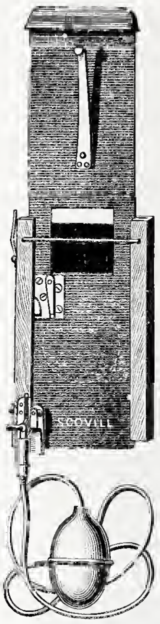


FIG. 401.—DROP SHUTTER.

Let x = distance of image from lens (*i.e.*, focal length) in feet;
y = " object " in feet;
d = amount of movement of object permissible in feet;
v = velocity of object transversely to axis of lens in feet.

Assuming that the amount of movement of the image on the plate permissible is $\frac{1}{100}$ inch, that is, $\frac{1}{1200}$ foot, we have

$$\frac{d}{\frac{1}{1200}} = \frac{y}{x} \qquad \therefore d = \frac{y}{1200\,x}.$$

Now, $\frac{v}{d}$ = the number of times the object traverses the permissible distance in each second;

∴ Time lens may be uncovered (speed of shutter) =

$$\frac{1}{\frac{v}{d}}\text{ sec.} = \frac{d}{v}\text{ sec.} = \frac{y}{1200xv}\text{ secs}$$

Examples ;—
If $x = 8''$ ($\frac{2}{3}$ foot), and $y = 10$ feet, and $v = 4\frac{1}{2}$ feet per sec., then

$$\text{Speed of shutter} = \frac{10}{1200 + \frac{2}{3} + \frac{9}{2}} = \frac{1}{360}\text{ secs.}$$

$$\text{If } y = 20 \text{ feet speed} = \frac{2}{360} = \frac{1}{180}\text{ sec.}$$

$$\text{If } y = 30 \text{ feet `` } = \frac{3}{560} = \frac{1}{120}\text{ sec.}$$

With many shutters very little effect is produced on the plate during the periods near opening and closing, and it is probable that the minimum time of exposure in such cases might be one-fourth or one-third more than the above without visible blurring.

Captain W. de W. Abney explained before the Camera Club, of London, a short time ago, his method of measuring the speed of photographic camera shutters, which has special advantages as regards accuracy and facility of record, brought about in a somewhat novel manner. In a report of his lecture, which we extract from the London *Amateur Photographer*,† are several interesting facts. The lecturer pointed out that it was quite as important to know whether we were giving an exposure of, say, $\frac{1}{10}$ or $\frac{1}{60}$ of a second as one of 5 or 15 seconds. The apparatus enables us not only to measure the time of exposure, but also causes any kind of shutter to draw its own diagram, and from this diagram several things are made known, *e. g.*, how long it took to

---

* "British Journal of Photography," 1891, p. 45.
† We are indebted to the *Scientific American* for the loan of the cuts illustrating this article.

THE PHOTOGRAPHIC TIMES.

AN ILLUSTRATED MONTHLY MAGAZINE DEVOTED TO THE ART, SCIENCE AND ADVANCEMENT OF PHOTOGRAPHY.

Issued on the fifteenth of each month.

EDITED BY WALTER E. WOODBURY, F. R. P. S.

SUBSCRIPTION RATES.

For one year, - - - -	$4 00	Three months' trial, - - -	$1 00
For six months, - - - -	2 00	Single copy, - - - -	35

On Foreign Subscriptions, $1.00 is added to pay postage.

Remit by Express Money Order, Draft, P. O. Order, or Registered Letter.

Subscriptions to THE PHOTOGRAPHIC TIMES received by all dealers in photographic materials in this and foreign countries, also by The American News Co. and all its branches.

ADVERTISING RATES WILL BE SENT ON APPLICATION.

Copy for advertisements must be received at office one week in advance of the day of publication. Advertisers receive a copy of the journal free, to certify the correctness of the insertion.

All literary contributions, correspondence, "Queries," etc., should be addressed to THE EDITOR; all advertising matter to the Publishers.

THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION,
60 and 62 East 11th Street, New York.

Businesses For Sale.

Advertisements will be inserted in this column at the rate of 25 cents per line of ten words. Display lines will be charged double. No Advertisement will be inserted for less than one dollar. Cash must in every case accompany copy, which should reach us not later than the tenth of each month.

STUDIO FOR SALE.—Wealthy N. E. City, unsurpassed location, elevator, steam heat, 12 rooms, all on one floor. Ample room. Cabinets $6 per dozen. 45,000 population to deal with. Sale for high class large work $40 to $75 each. $1,500 cash, and no less. You can more than pay for it first year, present owner going to larger city. B. H., care "Photo Times."

Would like to buy gallery—buy interest—work on shares, or for small salary. Six years experience. Can print, retouch, operate, and make crayons. Samples sent on application. B. W. Taylor, Rocky Mount, Va.

FOR SALE.—Well established photograph studio, business, good will, etc., in a New England town of 25,000 inhabitants. *Patronage first class.* Good reason for selling. Address, for particulars,
WILLIAM RICHARD GRIFFITH,
Real Estate Broker, 265 Main St., Hartford, Ct.

Employment Wanted.

Wanted—By a lady of much experience, a position as reception room attendant, spotter, and general assistant; also can make herself useful in light work, as sewing, etc., if desired. Address "M," Box No. 688, Hartford, Conn.

Position wanted by first-class operator who understands the whole business thoroughly. Address "Operator," 4737 Adaline Street, West Philadelphia, Pa.

Wanted, *first-class* retoucher and all-round workman, also a *first-class* printer and finisher. Steady position. Frank B. Moore, 1008 Canal Street, New Orleans.

Employment.

ADVERTISEMENTS OF OPERATORS SEEKING SITUATIONS WILL BE INSERTED FREE OF CHARGE.

Employment Wanted.

LANTERN SLIDES.—I make a specialty of Slides from Diagrams, Prints, etc. for lecture purposes.
H. H. WILLIAMS, Charlottesville, Va.

A young lady, experienced, desires a position as attendant in reception room, printer or assistant finisher. Laura Walker, North Salem, Indiana.

Enployment wanted—An operator, posings original, artistic and characteristic of subject, child specialist (formerly with Guerin.) Salary $20. Ad. Operator, 1005 Fourth Avenue, Louisville, Ky.

Position wanted by first-class photog. and portrait artist; operate, retouch and general workman. Portraits in water color, crayon or sepia. Have air brush and complete outfit. J. Howard Trezise, 1350 Silver Street, Philadelphia.

An experienced photographer will be open for engagement by February 10th. The East preferred. Address, B. 19, care J. S. Allen, 110 Guaranty Loan Building, Minneapolis, Minn.

View operator wants permanent position with responsible parties. Five years' experience in group, landscape and architectural photography. Harvey, 268 North 9th Street, San Jose, Cal.

Experienced operator, and water color artist will be open for engagement, or partnership on porcelain miniatures with good manager, about April 1st. H. B., care of *Times*.

Young man who has been an amateur for some time would like situation in studio. Natural ability. Best of references. Apply C. G. Appleton, Haverstraw, N. Y.

Position wanted—Strictly first-class retoucher and finisher, and well experienced all around man. Age 25. Speak German and English. Address "Artistic." 215 Washington Street, Newark, N. J.

Note.—Some interesting reading matter will be found on the following pages.

IN ADDITION TO
French Satin Jr.
THE STANDARD BLUE PRINT PAPER

We are Manufacturing a line of

Photographic Specialties

The same careful supervision which controls the manufacture of our Blue Print Paper will be extended to these new products, of which we have ready

MILLEN'S

- NORMAL PHOTOGRAPHIC DEVELOPER
- CHROMIUM FIXING SALT
- STANDARD WHITE PASTE
- HARDENING SOLUTION
- HYDROQUINONE (*Chemically Pure*)

Send for descriptive circulars of any of the above articles

J. C. MILLEN, M. D.,
Manufacturing Chemist,
DENVER, COLORADO: *No. 1731 Welton Street.* U. S. A.

FOR SALE.—Three Photo Gelatine Power Presses (Faber-Schleicher), formerly belonging to the F. Gutekunst Co. Will be set up in running order and instruction given. The Albertype Co., 15 Laight Street, New York.

H. B. PUTERBAUGH, PHOTOGRAPHER AND PROCESS ENGRAVER.

JOHN CARBUTT, Esq., Wayne Junction, Pa.

Dear Sir: Sample of your "New Process Plate" at hand and tested with the MOST PLEASING RESULTS. I send herewith a small order for Strippers, and if I have as good success as I had with my first trial, I shall discard the wet plate process FOREVER, for I am disgusted with it.
Very respectfully,
(Signed) H. B. PUTERBAUGH.

RETOUCHING FOR THE TRADE—First class work at moderate prices. Address Miss ALICE WINSLOW, 1,129 N. Main street, Brockton, Mass.

LANTERN SLIDES.—If you require good ones from your negatives send to

H. H. WILLIAMS, Simeon, Va.

MORAN'S NEW BARGAIN LIST No. 48,

READY MARCH 1st.

If you want anything in the Photographic line, it will pay you to send for it.

FREE USE OF DARK ROOM.

R. H. MORAN, 22 East 16th St., New York.
One Door West of Union Square.

SPECIAL NOTICE.

BACKGROUNDS
FOR CARBON AND PLATINUM EFFECTS.

W. F. ASHE, Scenic Artist,
76 East 9th Street, - - New York City.

JOHN BRADLEY,
...MANUFACTURING CHEMIST...
SOLE MAKER
OF
PROFESSIONAL PLATINUM ...PAPER...
THE PAPER ON WHICH MASTERPIECES ARE MADE.
Representing the highest standard of Photographic Art.

Developer, Small Size, - .15
" Large " - .35

Mailed free on Receipt of Price.

Special Price per Gross on Application.
Price List of Printing for the asking

SIZE.	J. Smooth Per Doz.	B. Rough Per Doz.
3¼ x 4¼	$ .25	$ .25
4 x 5	.35	.40
4¼ x 6½	.50	.55
5 x 7	.55	.65
5 x 8	.70	.80
6½ x 8½	.95	1.10
8 x 10	1.45	1.60
10 x 12	2.20	2 50
11 x 14	3 00	3.45
14 x 17	4.75	5.50
16 x 20	0.60	6.25
20 x 26	8.00	9.00

J. BRADLEY, { **THE ARTISTS ASSOCIATION,**
47 N. Thirteenth St., Phila., Pa.

THE ALBERTYPE COMPANY
PHOTO GELATINE PRINTERS
15 LAIGHT ST., NEW YORK.
VIEWS MADE INTO **SOUVENIRS**
at short notice, from photographs or negatives.
SEND FOR SAMPLES AND EDITION PRICES.

BARGAINS IN LENSES.

Some of these Lenses are new. All are in perfect condition.

	List Price.	Sell For.
1 8 x 10 Ross Rapid Symmetrical Lens, Waterhouse D.	$55.25	$33
1 15 in. Ross Portable Symmetrical, Iris Diaphragm,	65.75	40
1 12 in. Ross Portable Symmetrical, Iris Diaphragm,	59.50	35
1 8 in. Ross Portable Symmetrical, Iris Diaphragm,	38.00	23
1 6 in. Wray Wide Angle Rectilinear, Rotary Diaphragm,	24.00	15
1 4⅜ in. Wray Wide Angle Rectilinear, Rotary Diaphragm,	22.00	12
1 12 in. Wray Single Landscape, 8 x 10,	36.00	17
1 Prosch Shutter fitted to same,	12.00	3

Any of these Lenses will be sent by express on receipt of price, subject to one week's trial. If returned, express charges prepaid, in good condition, money will be refunded. Address

HENRY G. PEABODY,
338 Washington Street, Boston, Mass.

Use "Non-Cockle" Mounting Paste.

PHOTOGRAPHIC MATERIAL MF'RS.
R M W Co
ROCHESTER N.Y. U.S.A.

A CHALLENGE.

Unscrupulous competitors are systematically circulating the impression that Vera Matte is not permanent and as this paper has been subjected to tests which have established its superior merit beyond all question, such statements from the employees of other paper manufacturers are obviously based upon purely mercenary principles and ordinarily would be entitled to little attention.

On this particular point we have only to say that we hereby offer **$1000.00** as a reward, for proof that "**R. M. & W.**" papers are not equal to any on the market in permanency, brilliancy or the general beauty of the effects produced upon them.

Reichenbach, Morey & Will Co.,
Rochester, N. Y.

The Victorian Classic

A Classic of Literature; a Classic of Friendship; a Classic of Consolation; a Classic of Artistic Interpretation.

Tennyson's In Memoriam

Critical Preface by HENRY VAN DYKE.
Exquisitely Illustrated by HARRY FENN.
Elegantly printed, bound in silk, boxed, $3.50.

"Unquestionably the greatest poem of the century. It contains the deepest thought, the tenderest affection, the holiest aspiration, of the chief English poet of our time. . . The present volume is a worthy setting for such a noble work. . . A classic edition of a great classic."—*N. Y. Observer.*

"A classic of Friendship. Dr. VAN DYKE says: He turns back to trace the pathway of friendship, and remembers how love made it fair and sweet, doubling all joy and dividing all pain."—*Preface to this Edition.*

"A classic of consolation. . . For one who seeks a gift for a friend in sorrow, nothing could be more beautiful and appropriate."—*The Church Economist, N. Y.*

"Mr. FENN knows the Tennyson landscape of old, and he drew these studies on the spot. As mere adornments they are exquisite, but they are true interpretations, greatly enhancing the point of the verse."—*The American, Philadelphia.*

FOR SALE BY

THE SCOVILL & ADAMS CO. OF N. Y., 60 and 62 East 11th St., N. Y.

DO YOU MAKE SOLAR PRINTS FOR CRAYON WORK . . . ?

If so

Use the Valley Endless Roll Paper.

VALLEY PAPER CO., HOLYOKE, MASS.

KING OF
FLASH LIGHT POWDERS.

LUXO

PATENTED.
FOR SALE BY ALL DEALERS
W. P. BUCHANAN. PHILADELPHIA.

THE NEW GILSON ADJUSTABLE ALBUM,

With Adjustable Covers and Interchangeable Leaves,

Is specially made for Amateur Photographers and Photograph Collectors.

It is the only album that fits collections of all sizes, employing from 1 to 48 leaves, which may be added or taken out without disturbing others by simply loosening a silk cord.

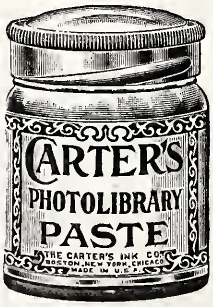
It is equally valuable for small or large collections, and is made in all styles and sizes of leaves and bindings.

Prices for Albums complete, 80c. to $5 00

For sale by Dealers generally. Send for Descriptive Catalogue S.

* * *

Mount your Photographs with



CARTER'S Photolibrary Paste,

A strong adhesive, quick in action and always ready for use.

Whiteness is a sign of purity. Beware of imitations which betray their impurities by their dingy color.

Carter's is pure white, bespeaking its chemical purity. If your dealer cannos supply you, a 14 oz. Jar will be sent, exprest prepaid, upon receipt of 25c.

THE CARTER'S INK CO.

BOSTON
NEW YORK,
CHICAGO
LONDON,
BRUSSELS

Reifschneider's Eclipse Albums are the Best.

BARGAIN LIST = = = No. 10

Will Be Issued in April, 1898.

Bigger than ever!

LENSES,
CAMERAS,
BURNISHERS,
STANDS,
BACKGROUNDS,
Etc., Etc.

No. 9 was mailed last October
Did you receive it?

We buy, sell and exchange Photographic Apparatus of all kinds. We supply any brands of Plates, Paper, Card Stock, etc., at lowest market rates.

RALPH J. GOLSEN,
146 State St., CHICAGO.

Albumen Paper

W. HEUERMANN,
23 CEDAR STREET, NEW YORK.

The 1898
American Annual
of Photography
Is sold out.

ALUMINUM
SUN FLASH POWDER
(PATENTED)
WILLIAMS, BROWN & EARLE
PHOTOGRAPHIC SPECIALTIES
PHILADELPHIA
FOR SALE BY ALL DEALERS

ASK TO SEE THE NEW
W. B. & E. ART ALBUMS
NO PASTING REQUIRED
WILLIAMS, BROWN & EARLE
PHOTOGRAPHIC SPECIALTIES
PHILADELPHIA
SOLD BY ALL DEALERS

Apparatus for making : : : :

FILMS

Or PICTURE RIBBONS, for moving-picture machines.

Perforators, Standard Gauge,	$100
Cameras, Hand, Spring, and Electric,	$75 and $150
Printers, Gas and Electric,	$25
Developing Trays,	$25 and $100
Complete plant,	$150

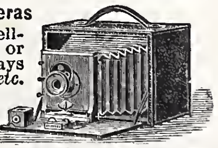
LIBERAL DISCOUNT TO TRADE.

C. FRANCIS JENKINS, 1325 F Street, N. W., Washington, D.C.

Always Ready.—A SINGLE Developer that never fails, energetic. Keeps indefinitely. Can be used over and over again until exhausted ; don't stain fingers, brilliant negatives, never appeared in print, great money saver. Cheaper by half than Pyro. Formulae mailed to any-one for $1.00. Address, Evans, No. 9 West Main St., Middletown, N. Y.

N. Y. CAMERA EXCHANGE

60% Saved on all makes of Cameras
Headquarters for Buying, Selling, and Exchanging Cameras or Lenses. Large assortment always on hand. *Developing, printing, etc.*
Photo supplies of every description at *lowest prices.*
☞ *Send 2c. stamp for bargain list.* Address
N. Y. CAMERA EXCHANGE, 41 Fulton St., NEW YORK.



Cameras and Cash

We've got the Cameras and want the cash. Photo supplies of all sorts and of all makers

Complete Photographic Library (56 instruction books covering the entire field of photography.) New Store—convenient. :: :: :: :: :: ::

Prices that render the goods Prizes

The Scovill & Adams Co. of New York
Nos. 60 and 62 East 11th St.
(Five doors from B'way)

Send 35 cents for a sample number of The Photographic Times containing about 100 handsome photographic illustrations.

Are You Using Hammer Plates?

SELF TONING PAPER.

A Boon To Professional and Amateur Photographers

PERMANENT GOLD TONES WITHOUT A TONING BATH.

From the Printing Frame to the Hypo, and from the Fixing Bath to the Wash Tray. No Intermediate Processes.

Simplicity, Celerity and Durability combined with economy

SELF-TONING

TRADE MARK

The latest achievement of Photographic Research.

MANUFACTURED BY

AMERICAN SELF TONING PAPER MANUFACTURING COMPANY.

FOR SALE BY

THE SCOVILL & ADAMS CO. OF N. Y.,

60 and 62 East 11th New York.

Diploma and Medal Awarded at the World's Columbian Exposition, 1893.

THE ALBERTYPE COMPANY,

15 LAIGHT STREET, NEW YORK,

Near Canal Street, West.

Photogelatine Printing.

THE LARGEST PLANT IN AMERICA.

Specialty: Souvenir Albums, Booklets, Catalogues,

Made to Order from Photographs or Negatives.

(WRITE FOR SAMPLES AND EDITION PRICES.)

The Brilliant Developer.

This new developer surpasses all others in **covering power** and **cheapness**, it keeps for weeks after use, and a surprising number of plates can be developed in the same solution before it is exhausted. With equal exposures and equal time of development it will give as an average **three times** more **covering** than any other developer. It is a liquid developer and ready for use after being mixed with an equal quantity of a 10 per cent. solution of Carbonate of Potash. It is very clean and discolors very little even when kept some time after use.

After extensive tests, comparing it with Pyro, Ferro Oxalate, Hydrochinone, Metol Eikonogen, Amidol, etc., etc., it has been ascertained, that in using the Brilliant Developer as an average only **one third** of the time of **exposure** is necessary, compared with the exposure required when developing with the other developers, which is an enormous advantage, especially during dull weather. Thus much money, time, and work can be saved on plates, which otherwise would have been **lost** by **under exposure** or the object having **moved.**

The price is very moderate and lower than of the most developers at present in use, as the same solution can be used over and over again by adding from time to time some fresh Brilliant Developer.

The success this new developer is having in Europe is simply marvellous, especially with professional Photographers, who are as a rule, so reluctant to try new materials. It has obtained a prize at the **Berlin Exhibition for Photography,** and scores of testimonials are arriving every week.

FORMULA.

Dissolve 1 oz. of Pure Carbonate of Potash in 10 ozs. of water.
Mix 1 oz. of Brilliant Developer with 1 oz. of the above Potash solution.

If very soft negatives are required the proportion of potash solution may be increased.

FOR DEVELOPMENT OF BROMIDE PAPER,

for which the Brilliant Developer is also particularly suitable the following proportions are recommended:

½ oz. of Brilliant Developer.
½ " " Potash Solution.
1 " " Water.

This will develop a great number of Prints. For softer results more water must be added.

* * *

THE BARMEN DRY PLATES MFY.

TRADE AGENTS:

THE SCOVILL & ADAMS CO.
OF NEW YORK,
60 and 62 East Eleventh Street, NEW YORK.

BRUNE & HÖFINGHOFF,
Barmen, Germany.

Use the **Hammer** = =

Dry Plates

ABSOLUTELY

Uniform and Clean.

Incomparable

FOR THE STUDIO,

FOR THE HAND CAMERA.

NO FRILLING

IN HOT WEATHER.

For Sale ....
by
all Dealers
at
Popular Prices.

Hammer
Retouching
Varnish
is the BEST for
Fine Retouching.

Hammer Eikonogen and Metol
Developers
Ready for Use
are the FINEST
Prepared Developers
on the Market.

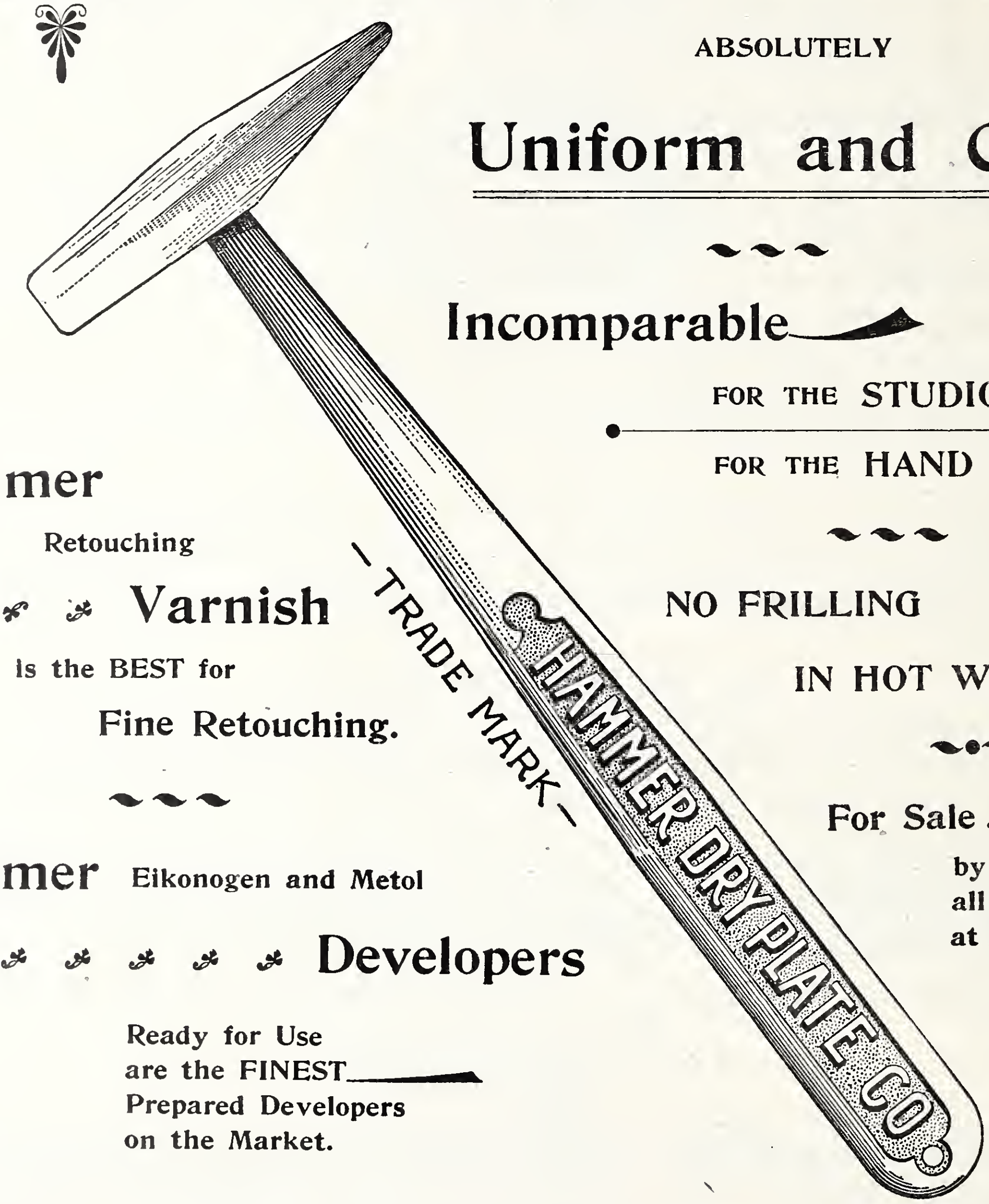
Send for Hammer's "Little Book" a short talk on negative making, mailed free to any address.

MANUFACTURED BY

Hammer Dry Plate Co.,

ST. LOUIS, MO.

THE SCOVILL & ADAMS CO. OF N. Y., EASTERN TRADE AGENTS.


—TRADE MARK—
HAMMER DRY PLATE CO.

MINOTT M. GOVAN,
Dealer in Photographic Supplies,
No. 5 Clinton Place, New York.
(Three doors from Broadway.)

Fully Illustrated Catalogue and Price List mailed on application. Lenses and Outfits a specialty.

DIETZ RUBY LAMP

For Dark-Room Use.

New Construction
Don't Leak Light.
1½x3x6½ ins.
NO SMOKE.

Sold by Dealers.
We send you one, prepaid, for 75 CENTS.
Circular free.

R. E. DIETZ CO., N. Y.

"Modern and Progressive."

Stephen B. Butts.
John F. Adams.

BUTTS & ADAMS,

TRADE B & A MARK

Photographic Supplies,

457 and 459 Washington Street,
BUFFALO, N. Y.

IS IT?

We think our **New Specialty** may be too fine for **your** trade but for fear we may be mistaken, send for price list and judge for yourself.

STONE BROS.
56. 58 and 60 Market St., Potsdam N. Y.

ACETYLENE GAS
FOR DOMESTIC
ILLUMINATION

is the latest and best form of lighting. Our

Patented Automatic Generators

make a private gas plant now practicable and economical.

Write to Department "H" for booklets and circulars which tell all about them and their wonderful product.

J. B. COLT & CO.,
MANUFACTURERS OF
Apparatus for the Production and Projection of Light,
STEREOPTICONS,
LANTERN SLIDES, Etc.

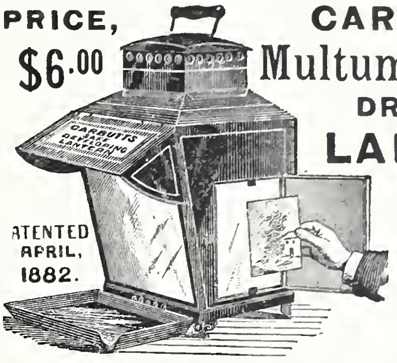
115-117 Nassau Street, - - - - - New York.
189 La Sulle Street, - - - - - - Chicago.
131 Post Street, - - - - - - San Francisco.
Erie Co. Bank Building, - - - - - Buffalo.

Exhibition Rooms,
New Zealand Building, Broadway & 37th St., N. Y. City.

A Rare Opportunity.

FOR SALE. A well established photo-engraving business: one of the leading houses in New York City. Present owners retiring from business. Responsible parties only need apply, in the first instance, to the Editor of this magazine.

PRICE, $6.00



ATENTED APRIL, 1882.

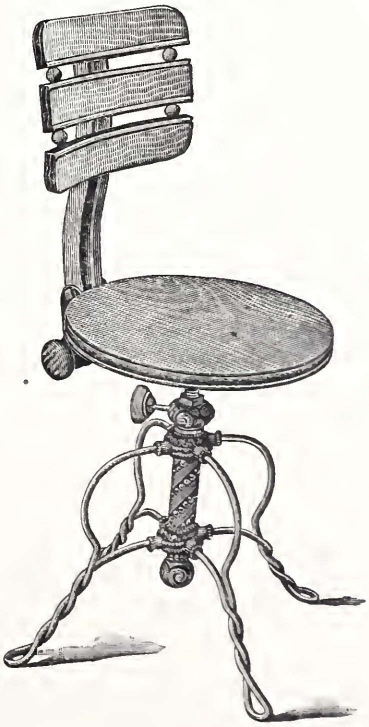
Lantern arranged for developing, and, after fixing, examining negatives and positives by opal light.

CARBUTT'S
Multum-in-Parvo
DRY PLATE
LANTERN.

The **Best** and **Cheapest** for all Dark-Room Work.

Manufactured by
JOHN CARBUTT
Wayne Junction,
Philadelphia.

Photographer's Chair
Indestructible

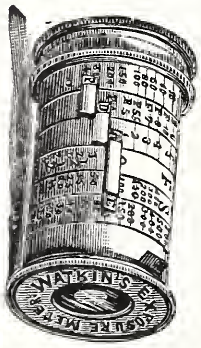


No. 2 PRICE, $6.00

IN OAK ONLY, OTHER FINISHES TO ORDER.
STEEL WIRE PEDESTAL, ANTIQUE COPPER FINISH.

The Scovill & Adams Co. of N. Y.
Trade Agents,
60 and 62 East 11th St., New York.

AVOID FAILURES IN MAKING NEGATIVES BY USING THE WATKINS EXPOSURE METERS.



THE NEW STANDARD (1895.) $5.00.

SIMPLER than the old standard, having one less pointer. Provided with the subject and enlarging scales, which do not obtrude themselves when not wanted. The only instrument made which is *absolutely complete* for all problems, especially copying, enlarging and contact printing without reference to tables. It supersedes the old enlarging pattern at a smaller cost. The best all round instrument, as for ordinary work it is quite as simple in use as the Watch or Junior patterns, though not made so light or convenient in shape; quite a feather-weight when made in aluminum. Provided with a pendulum, which is invaluable for timing the actinometer and camera exposures. Exposures under one second are now marked in vulgar fractions, on a distinct part of the scale to the seconds scale.

INSTRUCTIONS (for all ordinary subjects).—*Set pointer P to plate speed, D to the diaphragm, A to the light value, and E will indicate the exposure.*

For Sale by THE SCOVILL & ADAMS CO. OF N. Y., 60 & 62 E. 11th St.

P. P. P.

PROFESSIONAL PLATINUM PAPER

(Bradley Process)

A new black permanent low-priced Platinum Paper.
Try it and you will use no other.

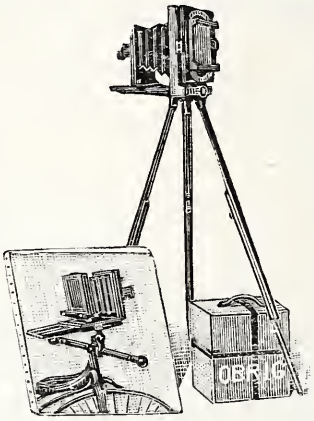
SOLD BY ALL DEALERS

WILLIAMS, BROWN & EARLE, SOLE AGENTS

PHILADELPHIA.

OUR FACILITIES

Were NEVER BETTER



For turning out good printing than they are at present. We are known for our good, even and careful work in this respect. With the word "**Printing**" we mean to cover not only **Albumen** and **Aristo** contact work, but **Platinotype** and **Blue Prints** as well. Bromide Enlargements are a specialty with us, and developing both plates and films receive our careful attention and are done at factory prices. Our little "**Booklet of Good Things**" contains prices for all this work, and can be had with our new **Bargain List** (just out) for a one cent stamp.

O. C. Co.'s well known "Special" Blue Paper, 25 cents per yard (cut to any size and mailed free).

OBRIG CAMERA CO.,
165-167 BROADWAY, NEW YORK,
NEAR CORTLANDT STREET.
TELEPHONE No. 4704 CORTLANDT ST.

We have a new KODAK and KODET booklet ready for distribution.

S. P. C. MONOGRAM

On a bottle of chemicals is a guarantee of excellence.

Insist on having the "S. P. C." brand.

For Sale by all the Trade.

STEINBACH & CO., MALMEDY, GERMANY

Manufacturers of

Photographic Papers

For Solar and Bromide Enlargements, Salting, Albumenizing, and Baryta Coating;

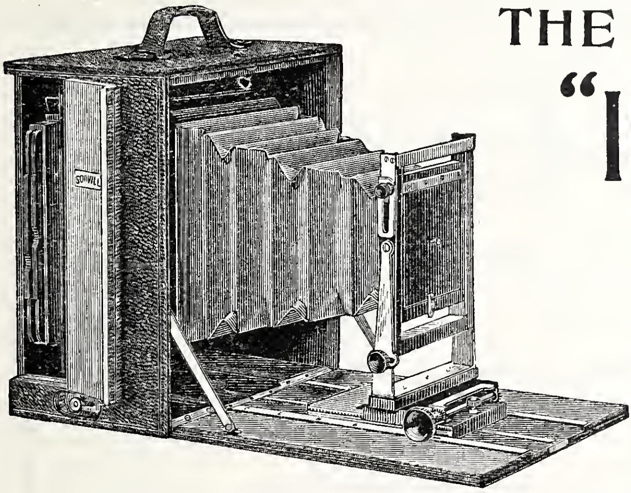
UNEXCELLED FOR BLACK AND BLUE PRINTING,

BARYTA PAPERS, GLOSSY AND MATT SURFACE.

SEND FOR SAMPLES AND ESTIMATES.

NEW YORK OFFICE:
621 BROADWAY.

PAUL PUTTMANN,
Sole Agent for the U. S. and Canada.



THE IMPROVED "IRVING-CLAY" CAMERA

THIS "fin de siècle" Camera, as it has been called, marks the highest attainment in camera manufacture *at the end of this century.* It is made at the works of the well-known American Optical Company, which in itself is a guarantee of perfection in durability of construction and fineness of finish.

A preliminary camera of this name was introduced some weeks ago, and the entire stock was quickly sold. The **Improved Irving-Clay** fully justifies its name, as it is a much improved form of the first camera of this class introduced. It contains two double holders instead of one, and the entire construction of the camera has been improved, with many useful and valuable features added.

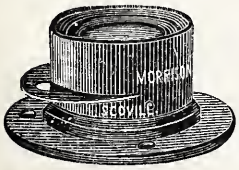
The Improved Irving-Clay combines the best features of the well-known "Henry Clay" and "Irving" Cameras, as its name indicates, and is the only hand and tripod folding camera with reversible self-adjusting spring back, and other features characteristic of these two cameras. It is made of thin spruce, highly polished, and is therefore extremely light and portable. It is covered with the best grade of leather, and possesses all the movements—swing back, front focus, shifting front and movable front boards—and conveniences which an "up-to-date" camera should have.

PRICE:		
	6½ x 8½, with *two* Double Irving-Clay Plate Holders,	$45.00
	8 x 10, " " " " " "	50.00

The Scovill & Adams Company of New York,

60 and 62 EAST 11th STREET, NEW YORK.

MORRISON WIDE-ANGLE VIEW LENSES.

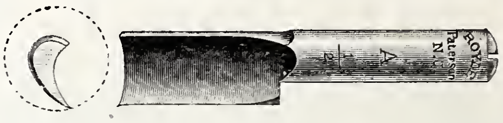


These lenses are absolutely rectilinear; they embrace an angle of 90 degrees, and are the most rapid *wide-angle* lenses made.

No. of Lens.	Diameter	Size of Plate.	Equivalent Focus.		Price.	
0	1 inch	3¼x4¼ inch	2½ inch	each,	$20.00	
2	1 "	4 x 5 "	3½ "	"	25.00	These 5 sizes will fit into 1 flange.
3	1 "	4¼x 6½ "	4½ "	"	25.00	
4	1 "	5 x 8 "	5¼ "	"	25.00	
5	1 "	6½x 8½ "	6½ "	"	25.00	
6	1 "	8 x10 "	8 "	"	30.00	
7	1½ "	11x14 "	10½ "	"	40.00	These 2 sizes will fit into 1 flange.
8	1½ "	14x17 "	14 "	"	50.00	

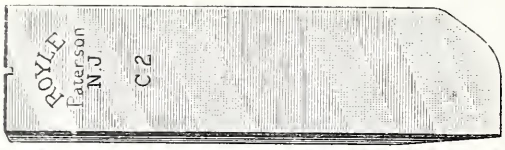
☞ **Nos. 1 to 6 are all made in matched pairs for stereoscopic work. The shorter-focused lenses are especially adapted for street and other views in confined situations. For general purposes, a pair of No. 5 lenses will be found most useful.**

FOR SALE BY ALL DEALERS.



CUTTERS for Routers, Bevelers, Edgers and Trimmers; Shoot-plane Irons, circular saw blades for wood and metals, and a variety of small tools, are part of our regular stocks. This is a branch of our business to which we pay special attention. By using carefully selected steel, tempered by the most approved processes, we are able to make tools of unusual excellence.

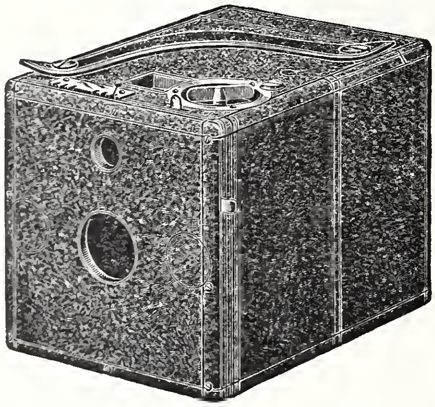
JOHN ROYLE & SONS,
Paterson, N. J., U. S. A.



The **Hawk-Eye, Jr.**

for the
Professional
as well as the
Amateur.

Price, $8.



Measures but 4¼ x 4¾ x 6 inches, has a square finder, automatic time register, improved time and instantaneous shutter, with different speeds ; loads in broad daylight and can be used with film for 12 or 25 ex. or glass plates.

Send for our catalogue of New Cameras.

THE BLAIR CAMERA CO., **Manufacturers, 22 Randolph Street, Boston.**

THE SPC ACID FIXING AND HARDENING COMPOUND

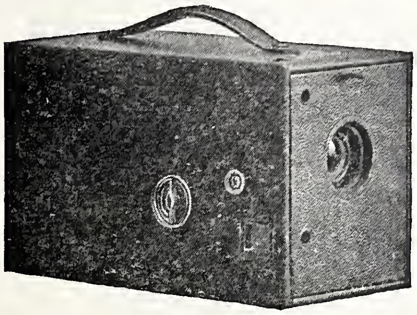
For NEGATIVES, TRANSPARENCIES, LANTERN-SLIDES and BROMIDE PAPER.

Destroys all developing fog and yields peculiarly beautiful and permanent results.

This solution can be used repeatedly so long as it fixes. It can also be used as a reducer of over density by a long continued treatment.

Price, in one lb. packages, only 25 cts. | **In one-half lb. packages, only 15 cts.**

FOR SALE BY ALL DEALERS.



SUNART TRIPODS

Send 2 cent stamp for Illustrated Catalogue.

All Stock Dealers handle Sunart Cameras.

"SO SIMPLE A CHILD CAN USE THEM."

THE LATEST.
SUNART JUNIOR, 3 1-2 x 3 1-2.

: : : $5.00 : : :

30 Styles, from $5.00 up to $125.00.

Developing and Printing Outfits, Etc.

Sunart Junior, No. 1, 3 1-4 x 4 1-4
The Sunart Magazine Camera : :
Folding and Cycle Cameras : : :

SUNART PHOTO CO.,
23 Aqueduct Street, Rochester, N. Y., U. S. A.

Have You

Secured

Your

GOERZ

ANASTIGMATIC

LENS

Yet?

Be sure

You get

One

Made by

Goerz.

(Patented.)

ALWAYS
Bright.

Will not jar out
All riders say it is
THE BEST.

THE BRIDGEPORT BRASS CO.,
BRIDGEPORT, CONN.
FOR SALE EVERYWHERE.

THE SCOVILL MAGNESIUM COMPOUND

IS ENTIRELY FREE FROM POISONOUS AND EXPLOSIVE INGREDIENTS.

In order to demonstrate this, quantities have been eaten at various times. It has often been pounded in a mortar to show that it does not explode.

FOR SALE BY ALL DEALERS.

Standard Papers for Photographic Processes.

B. F. K. RIVES

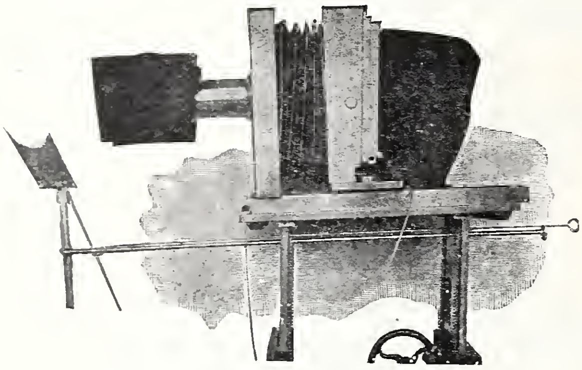
FOR ALBUMENIZING, ARISTOTYPE (GELATINE AND COLLODION), BROMIDE, SOLAR
CHEMICALLY PURE PHOTO BLOTTING PAPER.

NEW YORK OFFICE:
621 Broadway (Cable Building).

BLANCHET FRÈRES & KLÉBER,
RIVES—ISÈRE. (FRANCE.)

The Scovill Vignetter has no Equal.

Acme of Perfection Reached.



PRICE $10.00.

It is worth that much. When you see it, you will agree with us.

It is a nicely nickeled apparatus, perfection of mechanism, an ornament, and decidedly up-to-date, gives your camera an appearance of business.

The only Vignetter worked from back of Camera, having all the movements necessary for making any kind of a Vignette, without the use of STRINGS OR WIRE,

It can be used to great advantage in producing rich effects on light draperies, vignette being placed at top of draperies and rapidly lowered during exposure.

It can be adjusted to any stand and placed at any distance from the lens. The color of Vignette can be ascertained upon the ground glass.

For copying purposes it has no equal. Made in either Black Enamel or Nickel Plates. FOR SALE AT YOUR STOCK DEALER OR

The Scovill & Adams Co. of N. Y.
60 and 62 East 11th St., New York.

CLEMONS' ARROWROOT Salted PAPER

At last I have succeeded in suspending Arrowroot in solution by combining it chemically with another substance as a filler, that each sheet as it comes from the solution, carries with it an even heavy coating of the combined substance, that cannot be obtained by the old mode of applying of Matt surfacing, which I now have discarded, and each sheet will be stamped with a steel stamp . . . . .

"Clemons' Arrowroot Paper."

This paper gives much better Blacks and whites than any other make of paper put on the market.

I have discarded altogether the make of matt salted surface paper. A single trial will convince any one that it will make much the best prints of any plain paper made.

Made by

JOHN R. CLEMONS,

For Sale By

THE SCOVILL & ADAMS CO. OF N. Y.
60 and 62 East 11th Street.

Sample Sheets, 12 cents by mail.

Finest Quality and Absolute Uniformity are the marked features of

"PERFECTO" PAPER.

We do not believe in blow or bluster, neither do we claim that we have the only paper in the market. We do say, however, that if "PERFECTO" has an enemy in the world, we have yet to learn it.

What other paper firm can say this?

"PERFECTO" PAPER SELLS ON ITS MERITS.

THE "PERFECTO" ARISTOTYPE PAPER COMPANY
79 CORTLANDT STREET, NEW YORK.

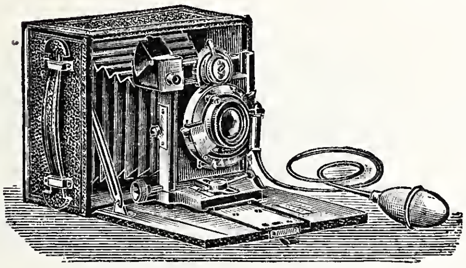
Gundlach

Optical Co.

ROCHESTER, N. Y.,

MANUFACTURERS OF

Photographic Apparatus....



The only concern in the United States turning out a complete camera, lens, and shutter, all of their own manufacture . . . . . .

OUR LENSES ARE WORLD RENOWNED.

....OUR SHUTTERS LEAD....

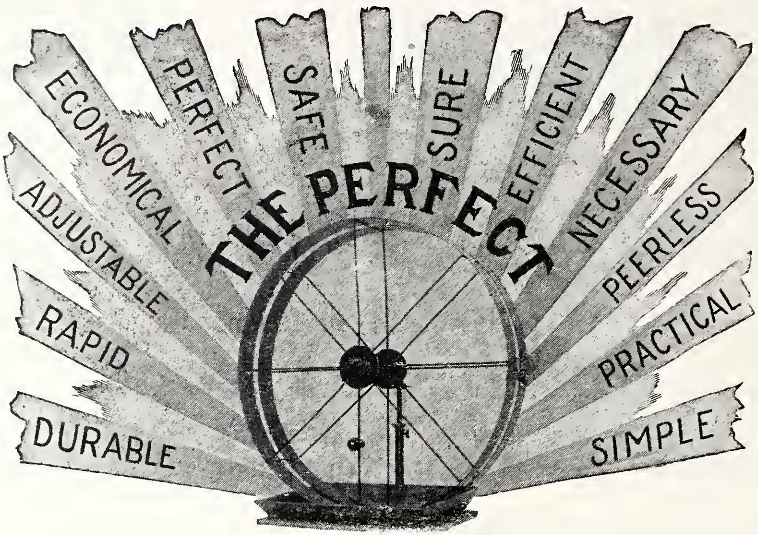
OUR CAMERAS ARE UNSURPASSED IN WORKMANSHIP OR FINISH.

Send for Catalogue.

Gundlach Optical Company,

753 to 765 SOUTH CLINTON STREET,

Rochester, N. Y.



PATENT PENDING.

DEVELOP YOUR OWN FILMS.

The "Perfect" Rotary Film Developer.

This is an entirely new and simple device for developing, fixing and washing films. Among its many advantages are:

GREAT TIME AND LABOR SAVING.

With a "Perfect" you can develop, fix and wash a film in less than one-third the time formerly consumed, and with no more labor than just simply turning the wheel.

EASE OF MANIPULATION.

The "Perfect" is the simplest possible device, and so easy of manipulation that a child might develop, fix and wash any film, a piece of work that formerly required skilful manipulation and great labor. With it the danger of scratching the face of the film in handling is entirely removed.

ADAPTABILITY.

The "Perfect" is adapted to take the film of the Pocket Kodak, Bullet, Bull's-Eye, Hawk-Eye, Baby Hawk-Eye, Presto, Kombi and various other cameras.

WATCHING THE DEVELOPMENT.

The "Perfect" is provided with a division in the surface of the wheel, so that a constant examination of the development is permitted during the process of developing, fixing and washing by transmitted light.

THOROUGHNESS IN WASHING.

The "Perfect" makes the process of washing most thorough, by simply turning the wheel in a tray of, or running water.

DRYING.

With a "Perfect" you can dry your films by turning wheel, thus creating a current of air. If extra haste is required, rotate first in a tray containing alcohol.

ADJUSTABILITY.

The "Perfect" is provided with a set screw so that the wheel can be raised or lowered to any point, permitting the use of a minimum amount of developer. In the removal or changing of trays, the wheel can be raised and the tray removed or changed without danger to the film.

SAFETY.

The "Perfect" is made of brass, heavily coated with Japan, and baked at a very high temperature, thus avoiding all danger of rusting or being attacked by any of the solutions.

ECONOMY.

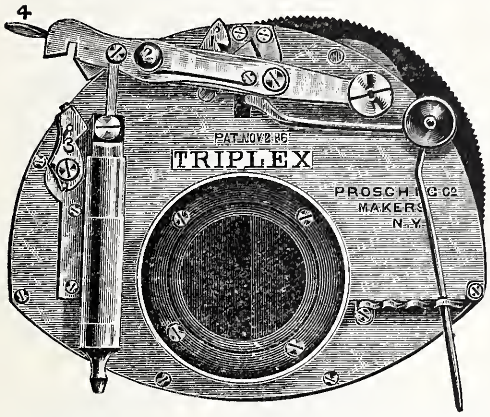
The "Perfect" is the acme of Economy, as films can now be developed rapidly and easily, thus saving the great expense, labor and time formerly consumed. Ladies will find the "Perfect" their Ideal, as a film can be developed, fixed, washed and dried without being touched by the hand.

Price $2.50. For Sale by all Dealers in Photographic Supplies.

THE SCOVILL & ADAMS CO. OF N. Y.

60 and 62 East 11th Street, New York.

THE PROSCH TRIPLEX SHUTTER



Excels all its rivals in **illumination, range** of speed, and keeps in repair.

TRIPLEX PRICE LIST.

Aperture in.	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3
Price, -	$14	$15	$15.50	$16	$16.50	$17	$18	$18.50	$19	$20	$22	$26

ATHLETE AND SPECIAL ATHLETE SHUTTERS FOR SPEED WORK.

TRIPLEX STEREOSCOPIC.

PROSCH STORAGE FLASH LAMPS.

LIGHTNING (ORDINARY SIZE,) . . $4 50.
PROFESSIONAL (LARGE SIZE,) . . $9 00.

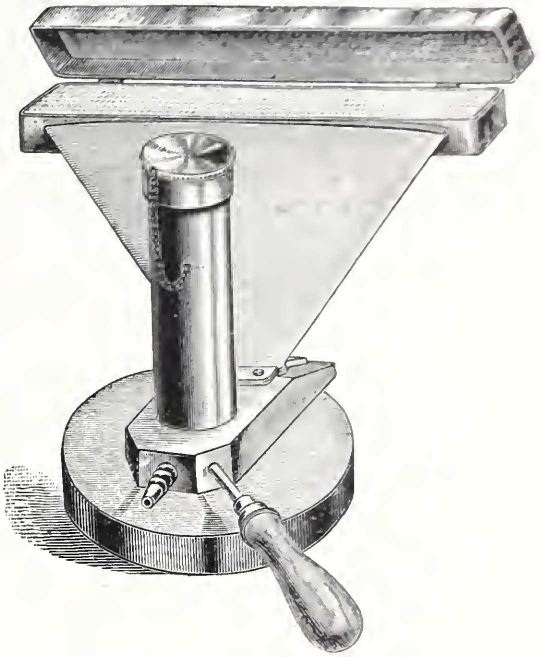
Are safe, reliable, give more effective illuminating light, with less smell, smoke and dirt than any other flash device on the market.

DUPLEX STEREOPTICON, oxy-hydrogen, of aluminium, with low pressure key and valves, and ¼ size Darlot lenses. **Price, $110.**

UNOPLEX MAGIC LANTERN, with 4-wick Oil Lamp, ¼ size Darlot lens, ... **Price, $50.**

Circulars on Application.

PROSCH MFG. CO.,
389 BROOME ST., NEW YORK.


PROFESSIONAL FLASH LAMP.

ACTIEN-GESELLSCHAFT FÜR ANILIN-FABRIKATION
BERLIN
GERMANY
GERMANY
United States of America Patent No. 475372.
United States of America Patent No. 475372.
Dr. M. Andresen's
EIKONOGEN
16 oz.
The right of utilizing Eikonogen for photography is protected by Patent in all countries. It is conceded to the buyer of this package and expires on the contents having been used
GESETZLICH GESCHÜTZT

Actien-Gesellschaft für Anilin Fabrikation,
BERLIN.

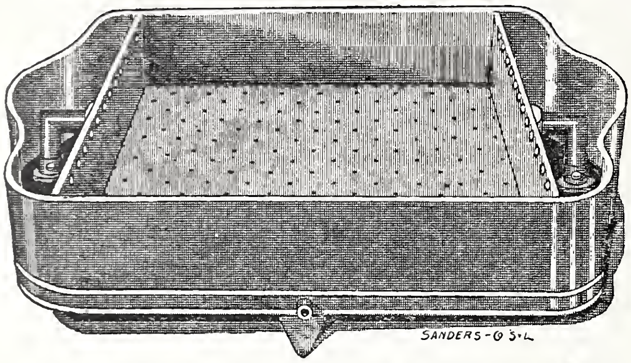
DEVELOPERS:

Eikonogen,
Rodinal,
Amidol.

Sold by all Dealers.

Ask your Dealer for Formulae and Samples.

THE CALIFORNIA AUTOMATIC PRINT WASHER,


SANDERS-G S.L.

WILL H. LEIGH, Inventor.

The principle on which the Automatic Washer is constructed provides for a constant and complete change of water with an upward and circular motion from being forced through the small holes, and an automatic rocking of the tank gives the entire body of water exactly the same motion that separates the prints in the ordinary tray by rocking. With this apparatus prints never settle to the bottom of the tank, but float in the water and move gently from side to side.

The face of each print is in this way presented to the moving water and imperfect washing is an impossibility.

Prints require no watching nor handling with this washer, thus saving its cost in labor alone.

They are furnished in three sizes, and made and finished for service and wear.

PRICES.

12x12 inches	$ 7.00
20x20 inches	$ 8.50
25x25 inches	$10.00

Leigh's-Combination Photograph-Printing Frame.

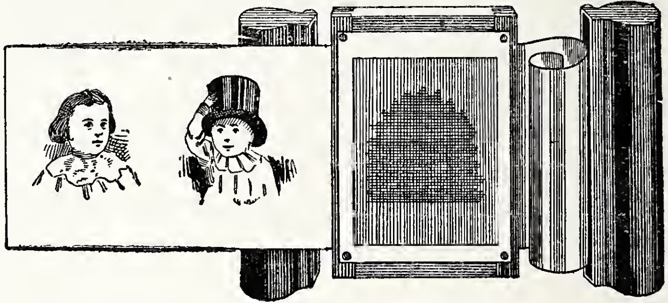
To quote the words of Mr. W. H. Leigh, the inventor, we would say that "The important point we claim for this frame is the doing away with joint lines, and equalizing the space between subjects for combination photographs, **WITHOUT CUTTING DOWN NEGATIVES**, thus often ruining them for future orders for single cabinets, etc."

Prints from ten inches to ten feet in length can be made from as many negatives as desired. The prints can be made side by side, or one above the other. Nothing makes better display work, nor attracts the public eye more than the **COMBINATION PHOTOGRAPH**.

We furnish two styles of frames, one to open in the regular way, taking paper the narrow way of the frame, and the other with lengthwise opening, taking the paper as shown in the illustration.

PRICES FOR EITHER STYLE COMPLETE.

5x7	$2.50 each.	6½x8½	$3.00 each.
5x8	$2.50 each.	8x10	$3.50 each.



FOR SALE BY DEALERS.

H. A. HYATT, Manufacturer, **410 and 412 N. Broadway, St. Louis, Mo.**

JONESBORO, TENN., May 4, 1897.

MESSRS. ALLEN BROS., DETROIT, MICH.

GENTLEMEN:—When I returned the 5 B Suter Lens, keeping the 3 A, I promised to let you know what I thought of the Suter Lens.

Well, I can safely say it is the best lens I ever owned, and, as I wrote you before, I had used fourteen different lenses and some of them were considered the best made, and I thought them pretty good till I tried the ones you sent me, and found so much difference that I am sorry I did not buy a Suter long ago. If I had, would have saved dollars in material, saying nothing about the trouble and disappointments that I have had with them. I have used the 3 A Lens for various kinds of work, in and out of doors, and every time I have gotten good results. For the past two weeks I have been making Views for a Society that is getting up pictures of all the old places of historic note about here, and have not yet failed to get a good picture, and if I had used other lenses I have, I am confident I would have failed on some of them, for some of the views were very difficult objects to photograph.

If there is anything you can get out of this that will be of any use to you, in the way of praise or recommendation to others in regard to the Suter Lens, you are welcome to use it; cut it down and pick out what you want, and if there is anyone you wish to refer to me for testimony, will gladly answer them. I am no optician, but think I know when a lens does the work as it should.

Yours very respectfully,

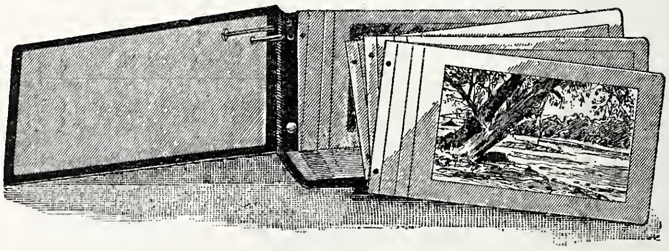
O. L. HENSLEY.

THE REGENT ALBUM.==INTERCHANGEABLE LEAVES.

THE REGENT ALBUM combines neatness with durability.

The patent interchangeable feature is constructed in such a manner as to allow the leaves to be readily removed and replaced with little or no trouble and in the twinkling of a moment.

The leaves of THE REGENT ALBUM lie absolutely flat and are perfectly rigid in the back.



PRICE LIST.

EACH ALBUM CONTAINING 25 LEAVES.

No. 1— 6 x 7	$1 25	Extra Leaves, White or Gray, per doz.,	$0 35
No. 2— 7 x 10	1 50	" " " " " "	45
No. 3—10 x 12	2 00	" " " " " "	75
No. 4-11 x 14	2 50	" " " " " "	1 00

LEAVES FOR SQUEEGEE PHOTOGRAPHS.

No. 1— 6 x 7	per doz.,	$0 50
No. 2— 7 x 10	" "	70
No. 3—10 x 12	" "	1 25
No. 4—11 x 14	" "	1 55

THE REGENT ALBUMS are bound in full cloth, handsomely embossed, finished with gilt title, and enclosed in a neat box.

THE LEAVES AND COVERS ARE ROUND CORNERED.

THEY ARE MANUFACTURED AND PATENTED BY **FELIX REIFSCHNEIDER.**

FOR SALE BY ALL DEALERS AND THE TRADE AGENTS,

THE SCOVILL & ADAMS CO. OF N. Y., - - - - - **60 and 62 East 11th St., New York.**

PHOTOGRAPHIC MATERIALS AND SUPPLIES
W. C. CULLEN
No. 61 WILLIAM ST. NEW YORK

SPECIAL NOTICE.

P. P. P.

PAGET PRIZE PLATES for Lantern Slides.

UNEXCELLED FOR QUALITY AND BRILLIANCY OF TONE.
HIGHLY SPOKEN OF BY THE PRIZE WINNERS.

Read what they say:

New York Camera Club,
Mr. W. C. Cullen: New York, March 30, 1896.

Dear Sir:—In answer to your inquiry, would say, I consider the Paget Lantern Slide Plate as without a rival. It is the only plate within my knowledge on which a variety of pleasing tones, running through the blacks, browns, purples and reds, can be produced at will, by *development* alone.

Yours truly,
Wm. A. Fraser.

Society of Amateur Photographers of N. Y.,
March 26, 1896.

Mr. W. C. Cullen:

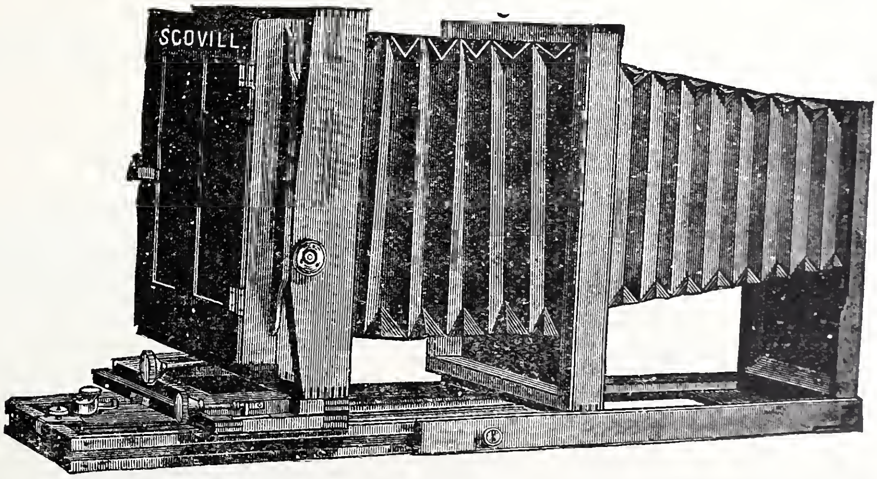
Dear Sir:—The Paget Lantern Slide Plates are superior to anything I have used. The majority of my prize slides were made with them.

Very truly,
W. B. Post.

W. C. CULLEN, Sole Agent for U. S.,
61 WILLIAM STREET, NEW YORK.

THE SCOVILL & ADAMS COMPANY'S

UNRIVALED PORTRAIT CAMERAS.



The American Optical Company Portrait Cameras are manufactured from the best mahogany, French polished, and have double bellows, vertical shifting front, the V-shaped wooden guide, telescopic platform, and Lever Focusing Attachment, by which the most delicate focus can be adjusted with the utmost facility and ease.

No.	Size.		With Double Swing-back.
5	8x10 ins.,	with platform 30 in. long	$38 00
6	10x12 "	" " 36 "	48 00
7	11x14 "	extension " 48 " and vertical shifting front	64 00
8	12x15 "	" " 48 " do	72 00
9	14x17 "	" " 60 " do	76 00
10	16x20 "	" " 65 " do	88 00
11	17x20 ins.,	extension platform 65 in. long and vertical shifting front	$90 00
12	18x22 "	" " 70 " do	100 00
13	20x24 "	" " 72 " do	110 00
14	22x27 "	" " 72 " do	130 00
15	25x30 "	" " 80 " do	170 00

(Taken on a Carbutt Orthochromatic Plate,
By Alois Beer, Photographer to Emperor of Austria.)

To obtain Artistic Results,

Carbutt

Non-Halation and
Orthochromatic Plates

Should be Used.

Also J. C. DEVELOPING TABLETS,
Put up in 3 sizes; Price, 25c., 40c., 75c.

STANDARD
FOR
TWENTY
YEARS.

Films Films

EUREKA
RIBBON FILMS

NEGATIVE AND POSITIVE.

For all Makes of
Chronophotographic
Cameras and
Projecting
Machines

SEND FOR CIRCULARS.

FOR SALE BY ALL DEALERS

CARBUTT

SEND FOR CIRCULARS

FILMS
(CUT SIZES)
PLAIN and
ORTHOCHROMATIC

LANTERN
PLATES

UNRIVALLED
FOR MAKING
Lantern Transparencies

SPECIALTIES:

Color Screens
Sizes 2¼x2¼ and 3¼x3¼.

Color Screens
For Photochromic Process.
Sets only. Sizes 2¼ x 2¼ and 3¼ x 3¼.

Multum-in-Parvo Lantern

Lantern Slide Mats

Lantern Slide Binders

Thin Crystal Cover Glass.

Developers.

PLATES

ECLIPSE
ECLIPSE JUNIOR
Orthochromatic 23 x 27
NON-HALATION
B 16
X-RAY PLATES
Transparency Plates
(Plain or on Ground Glass)
LANTERN PLATES
STRIPPING PLATES
HALF-TONE PROCESS

JOHN CARBUTT, KEYSTONE DRY PLATE AND FILM WORKS, WAYNE JUNCTION, PHILADELPHIA.

"Some Mounting Paste, please" says Inexperienced, and gets what the salesman pleases.

"Some ***HIGGINS' PHOTO MOUNTER,"***

says Experienced, and gets what pleases **him.** The difference is in the articles, and the moral is—if you want a **good thing** ask for it.

HIGGINS' PHOTO MOUNTER is a beautiful, pure, white adhesive, finely scented. A perfect homogeneous solution in a soft, pasty form, from which the water never separates, as in the common starch or flour pastes. Its beautiful, soft, unctuous consistency, and its wonderful smooth and easy spreading qualities (non fluid at rest but fluid under the movements of the brush) are possessed by no other adhesive, and are of the greatest importance in perfect and easy mounting. Does not strike through nor warp, adheres instantly and powerfully, dries quickly and prevents curling off at the edges. Guaranteed never to change or deteriorate. Unequaled for mounting photographs, textile samples, scrap-books, tissue work, and general use as a substitute for mucilage.

REFUSE ALL IMITATIONS.

FOR SALE BY ALL PHOTO SUPPLY HOUSES.

A 3-ounce jar, prepaid by mail, for thirty cents, or descriptive circulars for nothing, from

CHAS. M. HIGGINS & CO., Sole Manufacturers,

London Office, 106 Charing Cross Road. 168-172 Eighth St., Brooklyn, N. Y., U. S. A.

PHOTOGRAPHIC GOODS

OF EVERY DESCRIPTION.

SWEET, WALLACH & CO.

215-221 WABASH AVENUE,

CHICAGO.

Largest and Best Assorted Stock in the World

"NON-COCKLE,"

FOR MOUNTING PRINTS.

GUARANTEED NOT TO COCKLE.

40 Cents per Bottle.

For Sale by all Dealers in Photographic Goods.

IRON MOUNTAIN ROUTE

ST. LOUIS TO ARKANSAS, TEXAS MEXICO (THE EGYPT OF THE NEW WORLD) AND CALIFORNIA.

ELEGANT THROUGH SERVICE VIA THIS THE TRUE SOUTHERN ROUTE TO THE WINTER RESORTS OF THE SOUTHWEST

Write General Passenger Agent for Pamphlets giving Particulars.

C. G. Warner, W. B. Doddridge, H. C. Townsend,

ST. LOUIS.

Beware of Cheap Chemicals and Developers.

INSIST ON HAVING THE BRAND

S. P. C.

S.P.C.
SULPHITE SODA CRYSTALS
S.P.C.
HYPO. SODA

Your troubles will cease when you use them.

CURRENT LITERATURE ***CURRENT LITERATURE*** ***CURRENT LITERATURE*** ***CURRENT LITERATURE***

CURRENT LITERATURE ***CURRENT LITERATURE***

CURRENT LITERATURE ***CURRENT LITERATURE***

Current Literature

has never been anything but a delightful publication since the appearance of its first number. For the busy people who cannot read all the periodicals, or the family with the limited pocketbook, who can afford only one or two each month, *Current Literature* is an inestimable blessing, selecting and reprinting, as it does, the best things of the month. There is a charm in the very make-up of the magazine which is altogether distinctive."—*Art in Advertising.*

25 cts. a Copy. ***$3.00 a Year.***

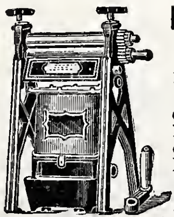
For Sale on all News Stands.

CURRENT LITERATURE,
Bryant Building, ***New York.***

CURRENT LITERATURE ***CURRENT LITERATURE*** ***CURRENT LITERATURE*** ***CURRENT LITERATURE***

WANTED

A good office desk. Must be cheap and in good order. Send full description or photograph to W. E. W., Editor, The Photographic Times, 60 and 62 East 11th Street, New York.



BURNISHERS

THE MODEL DUPLEX.
6 in., $ 7.50 8 in., $10
10 in., 12.50 12 in., 15

Every amateur should have one. Complete catalogue of Photo Goods, Tripods, Developers, Dry Plates, Cameras, Papers, Etc., free.

JAS. H. SMITH & CO.
311 Wabash Av., Chicago
Dealers supplied at manufacturers' prices.

USE THE

Standard Dry Plate.

They are the best high grade plate on the market, which are sold at the lowest popular prices.

Incomparable for the Studio and Hand Camera, absolutely clean, uniform and rapid.

We manufacture Non-Halation process, transparencies, plain and ground glass, lantern slide and X-ray Plates.

You will make no mistake in ordering the "STANDARD."

STANDARD DRY PLATE CO.,
LEWISTON, MAINE.

THE WATERBURY ALBUM

Is the latest thing on the market in the way of an Interchangeable Leaf Album.

Embossed Black
Cloth Covers,
White Leaves.

NOTE THE LIST PRICE.

7 x 10,	10 x 12,	11 x 14,
$1.10	**$1.60**	**$2.00**

THE SCOVILL & ADAMS CO. OF NEW YORK,
60 and 62 East 11th Street, New York City.

Look out for imitations of

REDUCED PRICE LIST.

WATERBURY CARDBOARD.

Look out for the genuine, too, and see that you get it.

WITH NEW PRICES.
SEND FOR A SAMPLE

It is the Best and Cheapest.

When purchasing a Developer please be particular to specify **Schering's** the oldest and most favorably known brand.

Put up with labels and seals as per fac-similes here given.

REGISTERED.

ONE OUNCE
PYROGALLIC ACID
RESUBLIMED
From E. SCHERING,
MANUFACTURING CHEMIST, BERLIN, GERMANY.

REGISTERED.

THE STANDARD OF THE LAST—THIRD—EDITION OF THE GERMAN PHARMACOPŒIA.

See that you get the Genuine "Schering's." Excelled by none

Send Orders to your Dealers, or to

THE SCOVILL & ADAMS COMPANY OF NEW YORK.

Remember

THAT

"Three Crown"

Albumen Paper

Is absolutely the BEST.

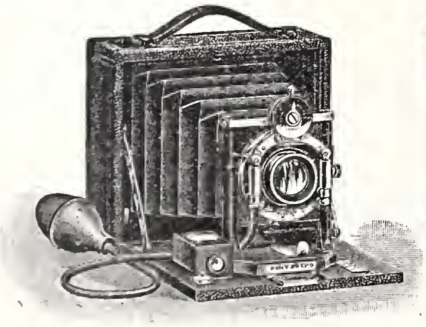
WHY?

Because none but the Best of the Rives Paper is selected for Albumenizing the THREE CROWN BRAND.

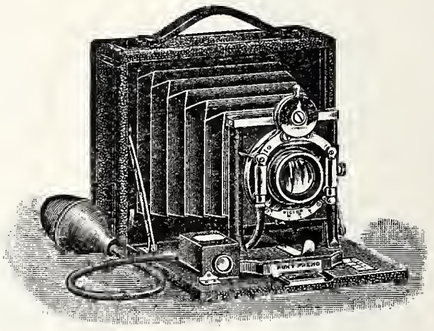
It is therefore free from the imperfections often to be found in other brands, which arise from defects in the plain paper, and hence cannot be avoided.

Premo Cameras **$5.** to **$50.**

Are the standard. If you purchase a Premo, you will know you have the latest and best, and will agree with us that . . . .



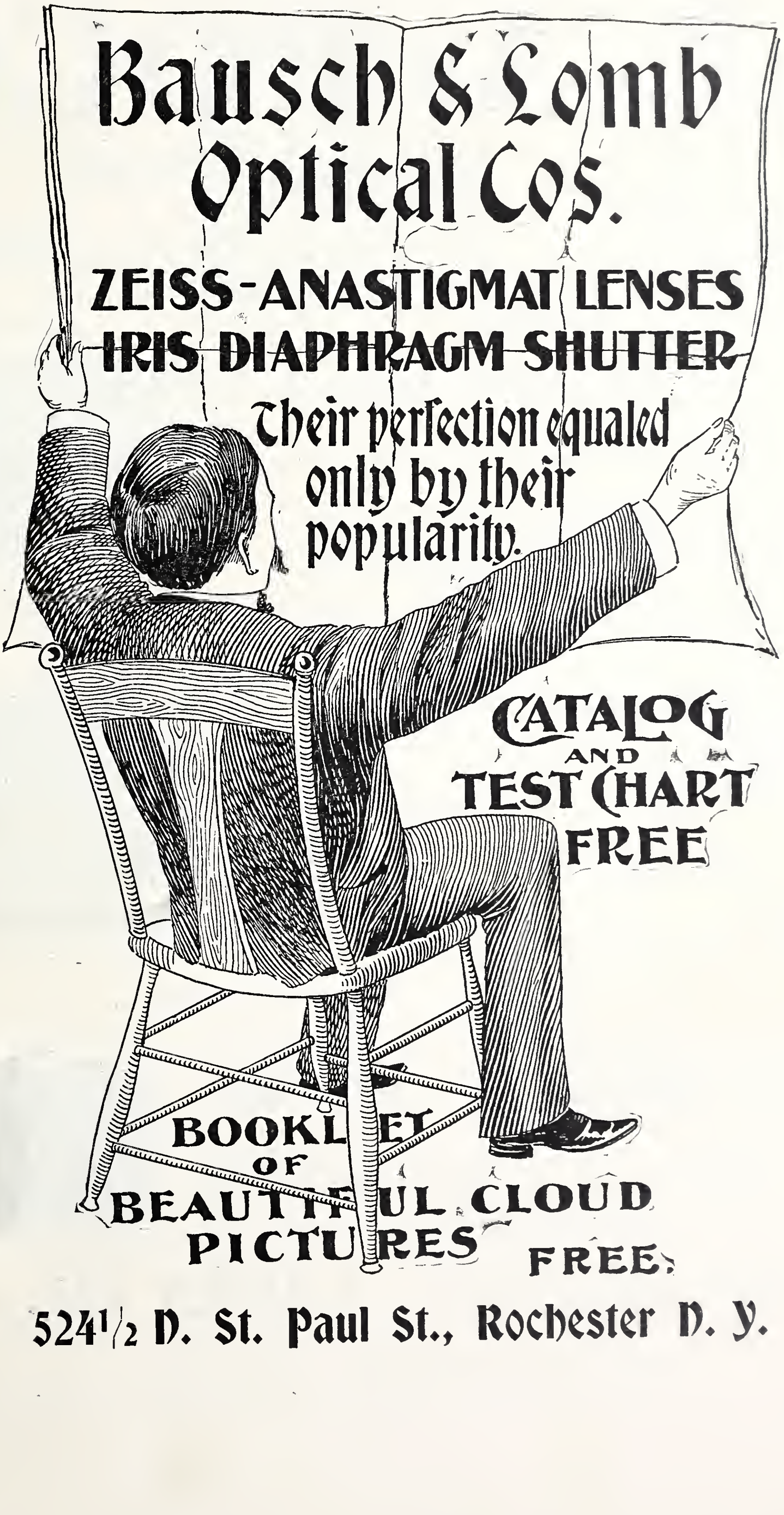
PREMOS
PRODUCE
PERFECT
PICTURES.



Send for Illustrated Catalogue.

Rochester Optical Co.

ROCHESTER, N. Y.



Bausch & Lomb Optical Cos.

ZEISS-ANASTIGMAT LENSES

IRIS DIAPHRAGM SHUTTER

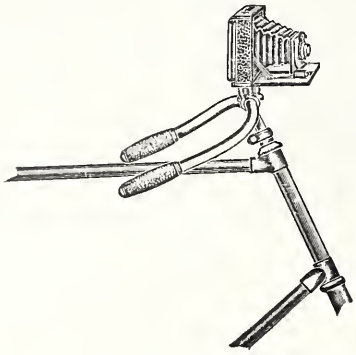
Their perfection equaled only by their popularity.

CATALOG AND TEST CHART FREE

BOOKLET OF BEAUTIFUL CLOUD PICTURES FREE.

524½ N. St. Paul St., Rochester N. Y.

A CAMERA IS A CAMERA.



Attached for use.

A POCO

IS ALSO

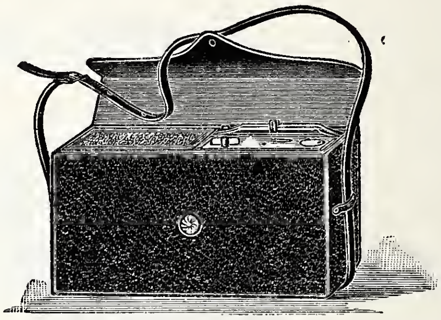
A CAMERA,

BUT OF THE

HIGHEST GRADE.

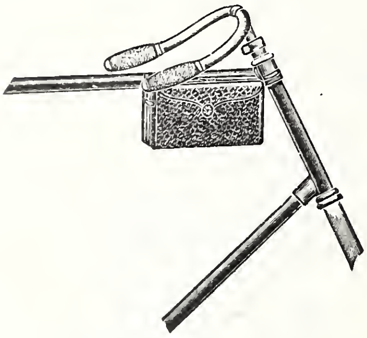
It is Manufactured by the

ORIGINAL ROCHESTER CAMERA CO.,



Packed in Case.

Which is a guarantee of its superior qualities.

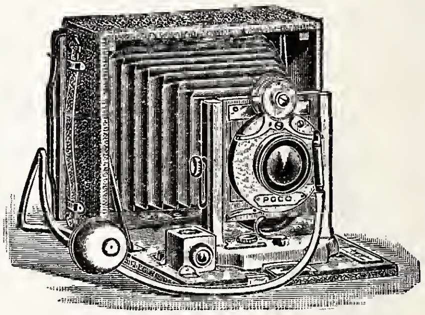


Attached for Carrying.

Cycle Poco,

Folding Poco,

Gem Poco,

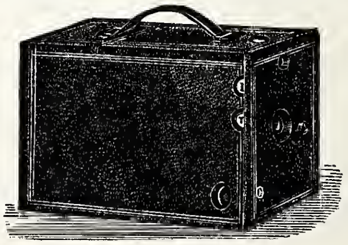


Open.

ALL PERFECTION AND UP TO DATE.

$5.00 to $100.00.

Takes Everything in Sight.



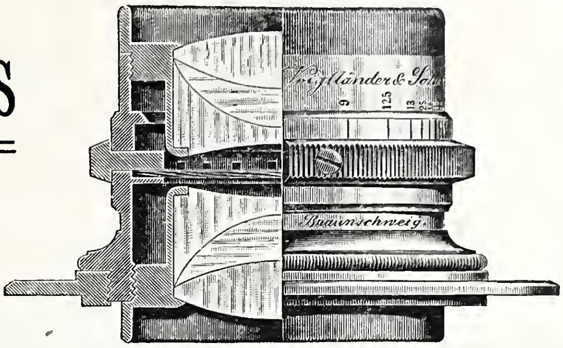
ROCHESTER CAMERA CO,.

Rochester, N. Y., U. S. A.

The Finest Lens yet Produced

: : : IS : : .

Voigtlander's Marvelous COLLINEAR LENS.



: : : THE FAMOUS : : :

Voigtlander Portrait and Euryscope Lenses,

Filling special needs, continue their popularity unabated.

The Genuine . DARLOT LENSES for all kinds of work, also best for . STEREOPTICONS are still to the fore.

The above Lense for sale by all Dealers and the Sole American Agents:

BENJ. FRENCH & CO., - - Boston, Mass.

THERE is only one genuine——

Platinotype Paper

which gives the art effects that Modern Photography demands —the Willis & Clements paper.

AA, thin smooth; BB, heavy smooth, and CC, heavy rough.

Rembrandt mounts (patented) and Platinotype Paper.

Send for Illustrated Pamphlet.

WILLIS & CLEMENTS,

1624 CHESTNUT STREET, PHILADELPHIA.

The Lundelius Magazine Camera, Patented.

For Professionals and Amateurs.

Small, Light, Complete, Always Ready, and under Positive Control.

NO Doors to Open. Slides to Draw.
Plate Holders. Shutters to Set.
Loose Parts. Obstrusive Fixtures.

But only to

Release the Shutter and turn down the Plate.

Operated entirely from the Outside to Focus, Change Plates, Diaphragm, and Speed of Shutter.

Indicator showing the number of unexposed plates.

Made in *three* standard sizes, 3¼ x 4¼, 4 x 5, and 5 x 7

Fitted with the following Lenses made by Gundlach Optical Co.:

Turner-Reich Anastigmat,
Instantaneous Symmetrical,
and Single Achromatic

All fitted with Iris Diaphragms.

Carries TWELVE Plates or Cut Films.

Catalogue, Testimonials, and Sample Photos on application.

Manufactured by **The Lundelius Camera Co., Incorporated, Port Jervis, N. Y.**

For Night Photography

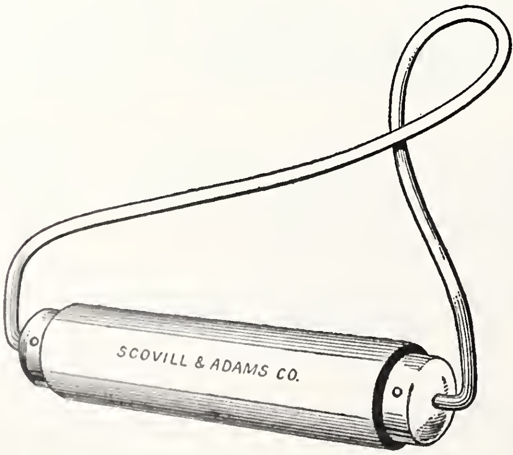
Why?

The Scovill Magnesium Cartridges Are the best

Because they give a more actinic light, produce less smoke, and are safer than any other in the market.

THE SCOVILL & ADAMS CO. OF N. Y.

60 and 62 East 11th Street.


SCOVILL & ADAMS CO.

SOMETHING NEW.

The Simplex Print Roller

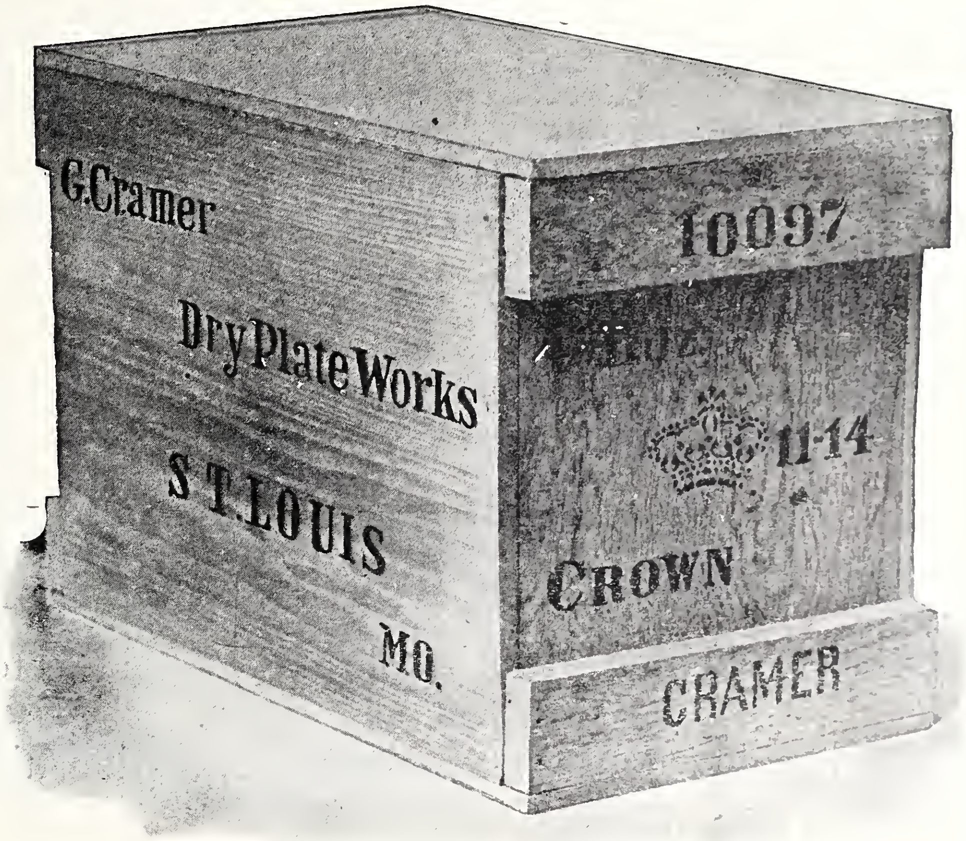
IS SIMPLE AND CHEAP.

ASK YOUR DEALER FOR ONE.

PRICE, 50 CENTS.

FOR SALE BY ALL THE TRADE, AND

THE SCOVILL & ADAMS CO. OF N. Y., Trade Agents.


G.Cramer
Dry Plate Works
ST. LOUIS
MO.
10097
11-14
CROWN
CRAMER

LIFE IS TOO SHORT

to bother with slow, tedious, and difficult printing processes. That's why you should use our Velox papers. They can be used at any time, day or night.

It takes an INCREDIBLY SHORT TIME for turning out LOTS of prints.

No process so Easy and Simple gives such ARTISTIC AND PERMANENT RESULTS.

Sample Packages of two dozen Cabinets, or 4 x 5, two Sample, Prints and Developer, will be sent on receipt of 50 cents.

We manufacture ALL KINDS of Photographic Papers, Gelatine, Collodion, Matt, Glossy, Bromide, etc., and

Our Record has given us an enviable reputation throughout the whole world.

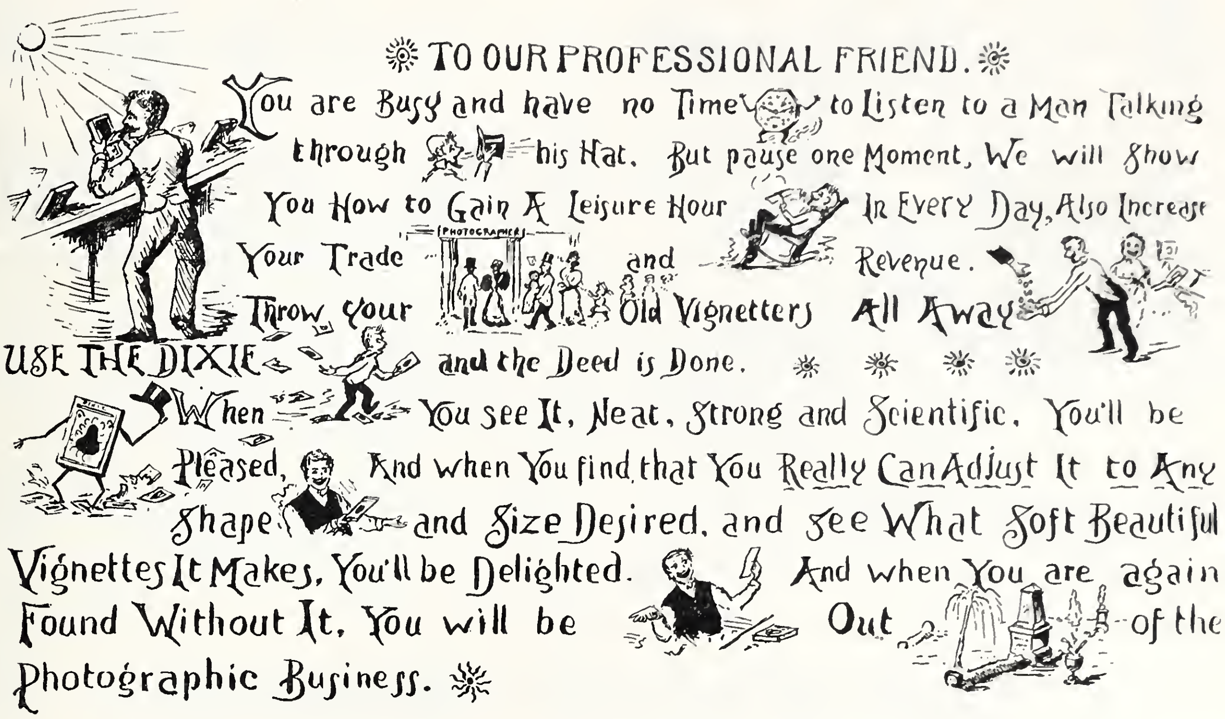
NEPERA CHEMICAL CO.,

Works and Head Office, Nepera Park, N. Y.

BRANCH OFFICES:

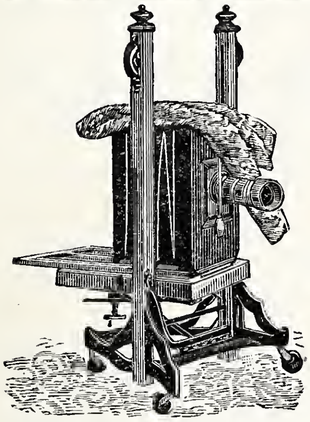
Chicago, Ill., 21 Quincy Street. Paris, France, 159 Faub. Poissonniere.

Order from your dealer, and if he does not fill your order, we WILL.



TO OUR PROFESSIONAL FRIEND.

You are Busy and have no Time to Listen to a Man Talking through his Hat. But pause one Moment, We will Show You How to Gain A Leisure Hour In Every Day, Also Increase Your Trade and Revenue. Throw your Old Vignetters All Away. USE THE DIXIE and the Deed is Done. When You see It, Neat, Strong and Scientific, You'll be Pleased, And when You find that You Really Can Adjust It to Any Shape and Size Desired, and see What Soft Beautiful Vignettes It Makes, You'll be Delighted. And when You are again Found Without It, You will be Out of the Photographic Business.



700 Photographers are NOW USING the

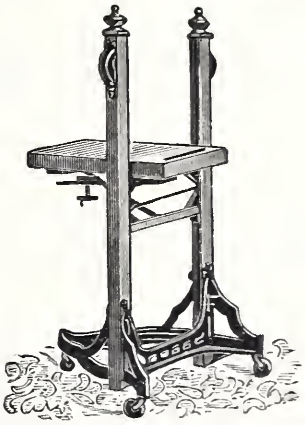
SEMI-CENTENNIAL CAMERA STAND.

THIS BEATS THE RECORD.

All Dealers sell them.
All Photographers like them.
All should have them.

Send for Price List. The ONLY Stand that gives satisfaction.

HORGAN, ROBEY & CO.
34 Bromfield St., Boston, Mass.



St. LOUIS OFFICE, 2005 Lucas Place. NEW YORK OFFICE, 57 East 9th St.

TRADE MARK
COPYRIGHT SECURED
WORKS AT WOODLAND, MO.

M. A. SEED DRY PLATE COMPANY.
ARROW BRAND

TO AMATEUR PHOTOGRAPHERS!
TRY THE NEW GOODS!!

SEED'S G. B. P. R. Lantern Slides, and . . . . .
Transparency Plates . . . .

Six different tones produced by development. Seed's **Positive Films,** with **Glossy, Matt,** and **Canvas finish** surface. **Seed's Prepared Dry Developers** in glass tubes and papers. Send for lists and copy of Seed's Manual. Order through any dealer in Photo Goods.

M. A. SEED DRY PLATE CO.

Prize Negatives

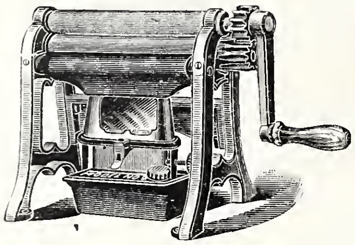
demand careful treatment. Film Negatives demand the best of treatment. The Perfect Album for Film Negatives holds 100 films 4 x 5 and under; holds them flat, where they are easy to get at. Indispensable to all who use films. Sent by mail for 15 cents each; but inquire at your stock-dealer's first.

GEO. C. BAKER. *Dept. F., Station S,* ALBANY, N. Y.

Dealers send for samples and discounts. A few general agencies open.

FOR SALE BY
H. N. TIEMANN,
General Agent for New York City, 19 West 42nd Street.

JUST OUT List, $10.00



8¼ IN. Acme Amateur Rotary Burnisher.

FULL NICKEL FINISH. ASK YOUR DEALER FOR SAME.

MANUFACTURED BY

Acme Burnisher Company,

FULTON, N. Y.

METACARBOL CHAVANT.

The most Powerful Developer Known.

Send for Free Sample Package.

VERY HIGHLY RECOMMENDED BY LEADING PHOTOGRAPHERS,

READ WHAT A FEW OF THEM SAY OF IT.

"Having used Metacarbol for a developing agent since its first introduction, with wonderful success, I can most heartily recommend it for its many qualities which are an advantage over all other agents for developing now in use. In the first place it is very uniform ; no danger of fog ; works equally as well for under or over-timed plate ; gives you the finest colored negative possible, which produces a beautiful rich print with all details fully preserved. Being a one-solution developer makes it convenient to work ; always ready for action ; does not injure your hands or system, nor leave your hands in an unpresentable condition.

"I have never had any trouble with under or over-timed negatives. You will when you come to print find the beautiful effect and all worry and trouble of over or under-timed negatives, which so mnch destroys the pleasure of the photograph business, will cease." J. M. Van Norman, Buffalo, N. Y.

"I received the sample of Metacarbol and have given it a trial. I like the results obtained with it very much. Will you quote price on it, and if in my reach will use it?" A. L. Bowersox, Dayton, O.

"Some weeks ago you sent us a sample of Metacarbol developer. We used it in developing a group that we are almost certain would not come with any other developer that we have ever tried. The white drapery was as fine as we have ever seen. It makes a smooth, brilliant negative." Knaff & Bro., Knoxville, Tenn.

"Sample of the new developer 'Metacarbol' you kindly sent to me is the best thing in the way of a developer I ever used. I made three negatives on 5 x 7 plates, Bausch & Lomb shutter one-hundredth second, and obtained full-timed negatives. It works well for portraits, making good crisp negatives, of good and quick printing qualities. You deserve the thanks of the fraternity for introducing the ideal developer, and I think you will have large sales of it. Kindly give me the price by the pound." W. H. Dunwick, Pulaski, N. Y.

"The test of Metacarbol developer was most successful. I found it equal to the best I ever used. Besides it does not stain the fingers." Geo. W. Ketcham, 25 Cliff St., New York.

"The Metacarbol worked very finely, equal in every way, if not superior to, the developing agents now on the market." George Steckel, Los Angeles, Cal.

"I have personally given it (Metacarbol) a very fair test, and find that it is a splendid developing agent." J. Ed. Rösch, St. Louis, Mo.

"The new developer, Metacarbol, pleased me very much. It is exceedingly rapid, and gives fine detail, clear shadows and splendid printing quality. Please send me 3 ounces." F. M. Somers, Memphis, Tenn.

"We were much pleased with Metacarbol, and find that by its use a much shorter exposure can be made than on a plate of same emulsion that has been developed in the usual way. Add me to your staff of consumers of Metacarbol." C. M. Hayes & Co., Detroit, Mich.

"Gents :—Send me one ounce of Metacarbol. I think it immense." G. H. Smyth, Milbridge, Me.

"Your Metacarbol is among the first of the new developers." Urlin Becker, Cleveland, O.

PRICE.

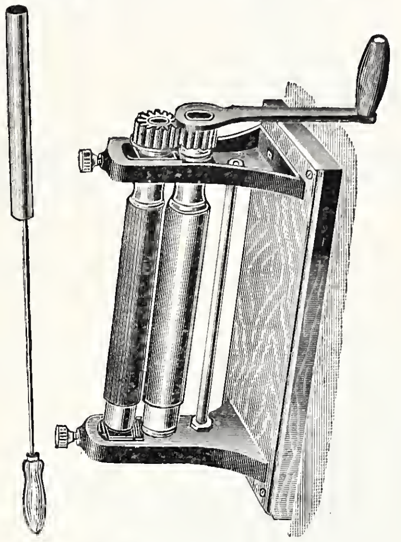
1-oz. bottle	$ 0.75
2-oz. bottle	1.50
4-oz. bottle	2.75
8-oz. bottle	5.25
16-oz. bottle	10.00

FOR SALE BY ALL DEALERS.

SUNSHINE BURNISHER!
(Patent Pending.)

No Danger or Expense by using Oil, Gas, or Gasoline. Will burnish up to 6½ inches,

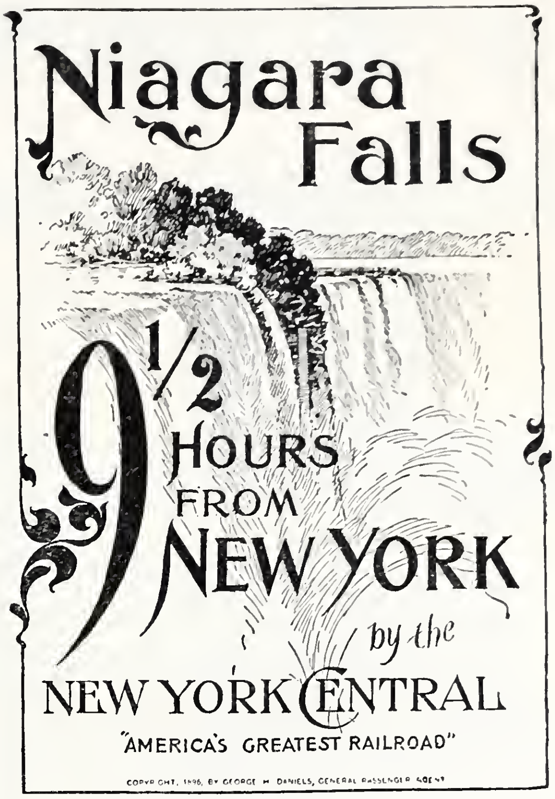
$5.00



$5.00

The Burnisher is heated by an iron, which is slipped into lower roller. It will burnish 20 or 25 photos with one heating.

Your Order Solicited By
The Scovill & Adams Co. of N. Y.,
60 and 62 East 11th St., New York.


Niagara Falls
9½ Hours from New York
by the
New York Central
"America's Greatest Railroad"
Copyright, 1896, by George H. Daniels, General Passenger Agent

The "SIMPLEX"
Printing Frame

Light, Compact,
Simple, Durable
and Inexpensive.

The Frame is made of Japanned Iron, with Wooden Back, covered with Billiard Cloth.

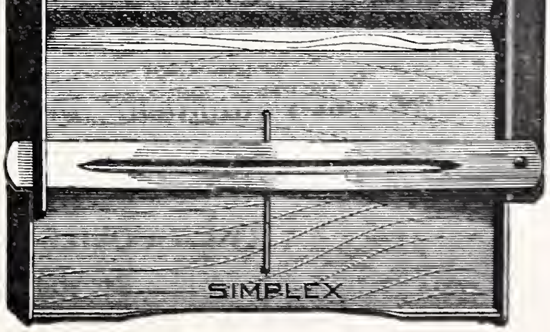
IT SELLS ON SIGHT!

Prices as follows:

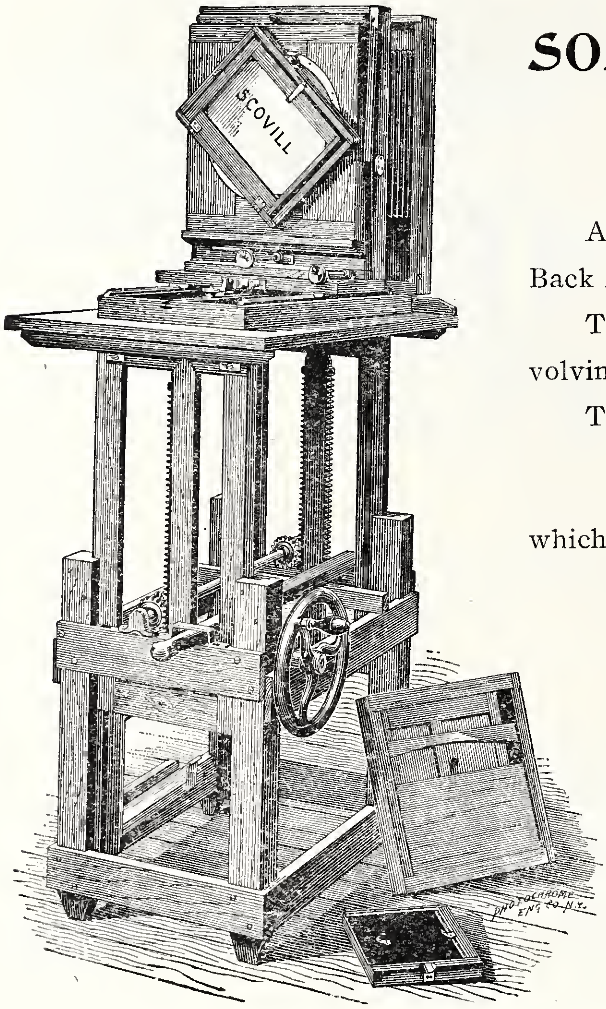
3¼ x 4¼, 3½ x 3½,	24c.
4 x 5,	25c.
5 x 7,	32c.
5 x 8,	35c.

For Sale by all Dealers, and....

The Scovill & Adams Co. of N. Y.,
60 & 62 East 11th Street, NEW YORK.



The Empire Portrait Outfit



SOMETHING NEW

For the Gallery.

An 8 x 10 Portrait Camera, fitted with a Revolving Back Adjuster for 5 x 7 plates.

The position of the plate is changed by simply revolving the turn table of the adjuster.

The outfit comprises also an

Empire Camera Stand

which description we give as follows:

Highest Point from Platform to Floor, ...	**41 Inches.**
Lowest Point from Platform to Floor, ...	**26 "**
Width of Platform, ...	**18 "**
Length of Platform, . . .	**30 "**

THE elevating is done by turning a handled wheel at the side of the stand; the gearing from this connects with the front and rear platform support, causing the platform to rise or fall according to which way the handle is turned.

All the back of the stand is a lever, which, when pressed to the right, throws the gear wheel in front out of gear, and locks the front platform support. On turning the handled wheel from you, the back of the platform is raised, giving the platform an inclination forward of about 15 degrees. By pressing the lever arm to the left the front gear is again placed in position, and upon turning the handled wheel from you, the platform may be raised without disturbing the dip of the platform. If the handled wheel is turned toward you, the platform will be lowered without disturbing the dip of the platform.

Price of Equipment complete, ... $45.00.

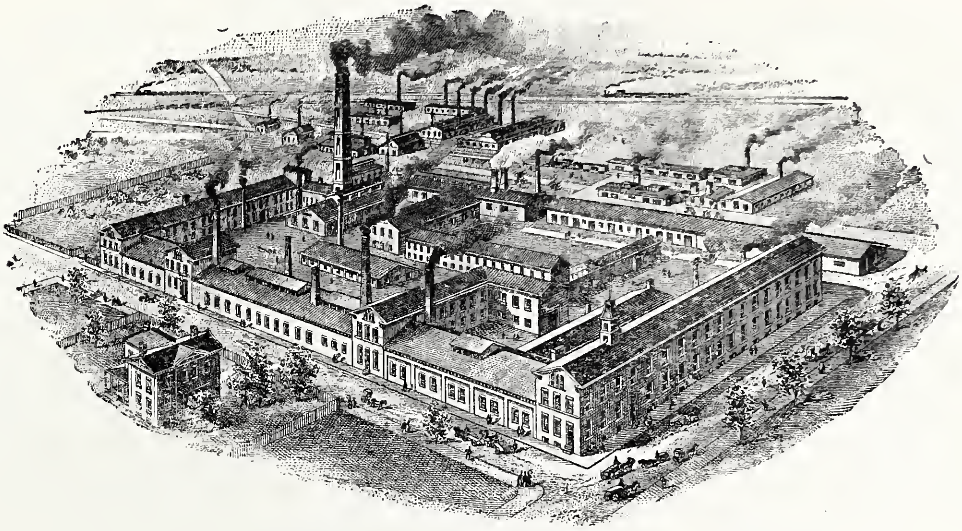
For Sale by all Dealers, and...

THE SCOVILL & ADAMS CO. OF N. Y.,
60 and 62 East 11th Street, NEW YORK.

CHAS. COOPER & CO. ESTABLISHED 1857.

Manufacturing Chemists and Importers,

194 WORTH STREET,
NEW YORK.



WORKS AT NEWARK, NEW JERSEY.

Chemically Pure Photo Chemicals.

NITRATE SILVER, CHEMICALLY PURE CHLORIDE GOLD,
SULPHITE SODA CRYSTALS AND GRANULAR. : : : : :
: : LITMUS PAPER, ACID SULPHITE SODA SOLUTION,
COMMERCIAL AND CHEMICALLY PURE ACIDS, ETHERS
AQUA AMMONIA, SOLUBLE COTTON FOR COLLODION PAPER.

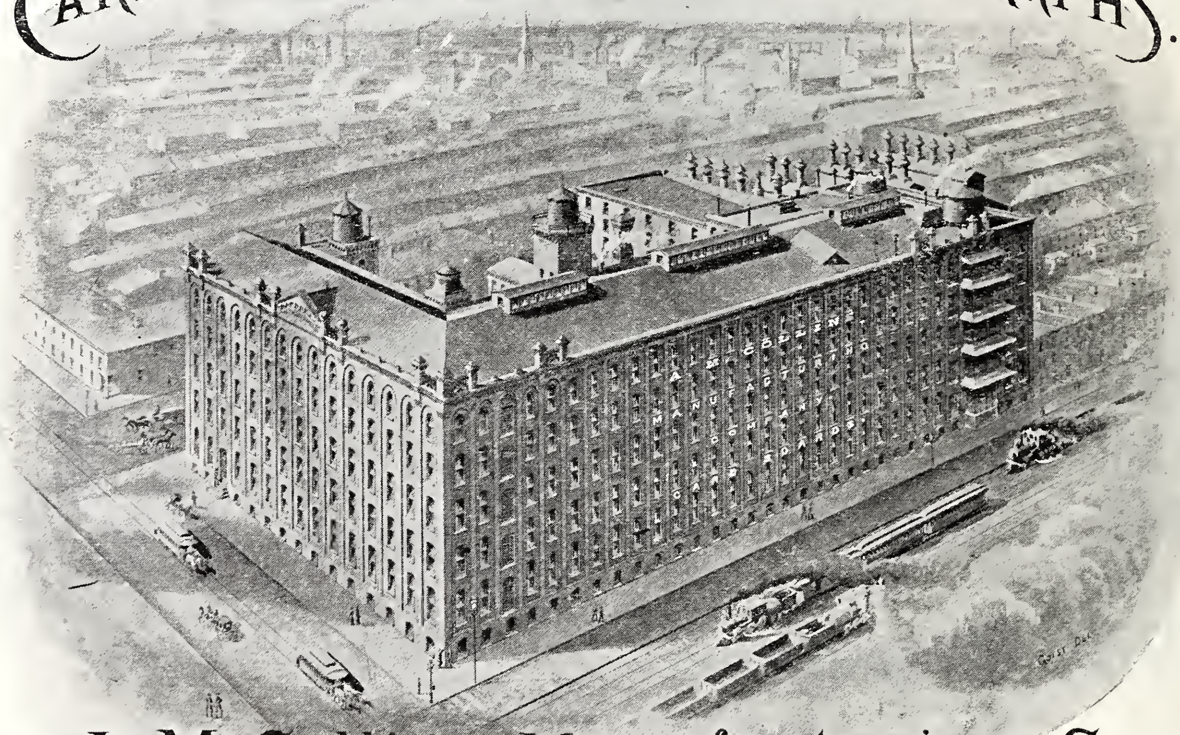
We Manufacture a full line of Chemicals, Medicinal, and for the Arts and Technical purposes.

Bromo-Oxygen, a most efficient disinfectant and deodorizer. Can be diluted with 32 parts of water.

MONTHLY PRICE LIST ISSUED.

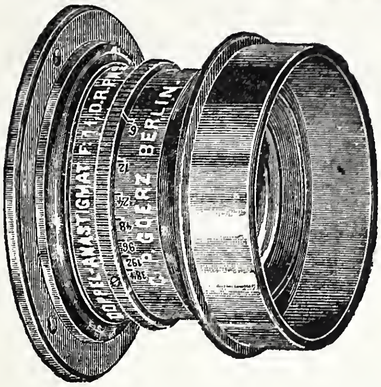
REFINERS OF PHOTO SILVER AND GOLD WASTE.

CARDS FOR MOUNTING PHOTOGRAPHS.

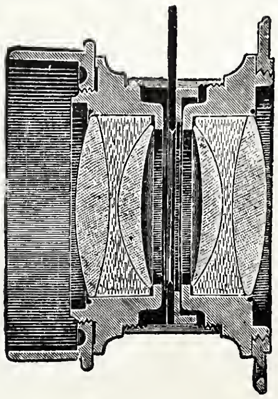


A. M. Collins Manufacturing Co.

No. 527 Arch St. PHILADELPHIA.



German Patent No. 74,437.
American Patent No. 528,155.



TRY THE GOERZ

Double Anastigmat

Before Buying Another Lens.

It will give you better definition, greater depth of focus and more illumination, over the whole of your plate than any other lens on the market.

FOR SALE BY ALL DEALERS OR

C. P. GOERZ,

52 Union Square East, - - - NEW YORK.

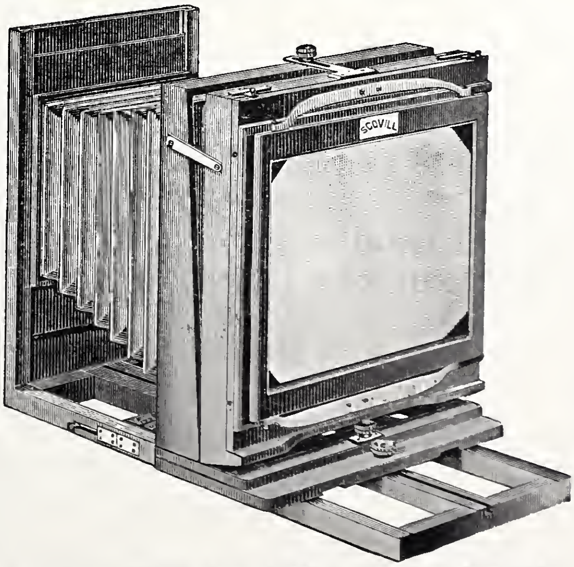
Factory at Berlin (Germany).

A NEW CAMERA

"The Reversible Landscape"

MADE BY THE AMERICAN OPTICAL CO.

To meet the demand for high-grade apparatus at popular prices. This camera is made of highly polished mahogany, with all the latest improvements, and patent self-adjusting ground glass frame, reversible back, and rising front.



PRICES:

6½ x 8½	Double Swing	$23.00
8 x 10	" "	25.00
11 x 14	" "	35.00
14 x 17	" "	50.00

THE SCOVILL & ADAMS CO. OF N. Y., 60 and 62 East 11th Street.

The Scovill & Adams Co.

Of New York.

60 & 62 East Eleventh Street, N. Y.

Are Trade Agents for and Supply:

THE GOERZ (NEW) DOUBLE ANASTIGMAT LENSES (PATENTED).
THE MORRISON FAMOUS WIDE ANGLE LENSES.
THE CELEBRATED WATERBURY (SINGLE ACHROMATIC) LENSES.

⁂

THE AMERICAN OPTICAL COMPANY'S APPARATUS.
THE FLAMMANG-SCOVILL-LEVY SCREEN PLATE-HOLDERS (PATENTED).
ALL STANDARD PHOTO-ENGRAVING GOODS.
SCOVILL REVERSING APPARATUS.
SCOVILL THREE-COLOR SCREENS.

⁂

HAMMER DRY PLATES.
THREE CROWN ALBUMEN PAPER.
EMPIRE COLLODION GLOSS (ARISTOTYPE PAPER).
EMPIRE COLLODION MATT (ARISTOTYPE PAPER).
EMPIRE GELATINE (ARISTOTYPE PAPER).

⁂

"DIXEY" VIGNETTERS.
SCOVILL (PATENTED) ZINC ADJUSTABLE WASHING BOXES.
SCOVILL (PATENTED) MAGNESIUM CARTRIDGES.
THE "WORLD" SPECIAL PHOTO-FINISH BLOTTING PAPER.
"SWEETHEART" ADHESIVE CLOTH.

⁂

S. P. C. CHEMICALS AND PREPARATIONS.
MERCK'S PYRO.
"NON-COCKLE" MOUNTING PASTE.
REIFSCHNEIDER'S "ECLIPSE" AND "REGENT" ALBUMS.
WATERBURY CARDBOARD.

⁂

THE SCOVILL PHOTOGRAPHIC SERIES OF PUBLICATIONS.
THE AMERICAN ANNUAL OF PHOTOGRAPHY.
THE PHOTOGRAPHIC TIMES (MONTHLY).
THE PRACTICAL PROCESS WORKER (MONTHLY).
EL PROGRESO FOTOGRÁFICO (MONTHLY).

Descriptive Catalogues and Special Price Lists on application.

Correspondence Solicited

Color . . . . . .

Photography

. . . . A Fact.

* * *

Any Amateur can take a Colored Photograph, in the colors of Nature, with his present Camera.

* * *

OUTFITS ARE NOW ON SALE.

* * *

THE COMPANY IS NOW READY TO SELL COLORED LANTERN SLIDES.

Send for descriptive circular to

JOLY-SAMBRA CO., Montclair, N. J.,

or to the Agents,

The Scovill & Adams Co. of New York,

60 EAST ELEVENTH STREET, NEW YORK.

THE EMBLEM
OF
PERMANENCY!

EIGHT YEARS' RECORD
HAS PROVEN IT SO.

The
Best printing-out papers, Aristo Platino, Aristo Jr., and Aristo Blue Label,
All Pure Collodion.

Manufacturers:
American Aristotype Co.,
Jamestown, N. Y.

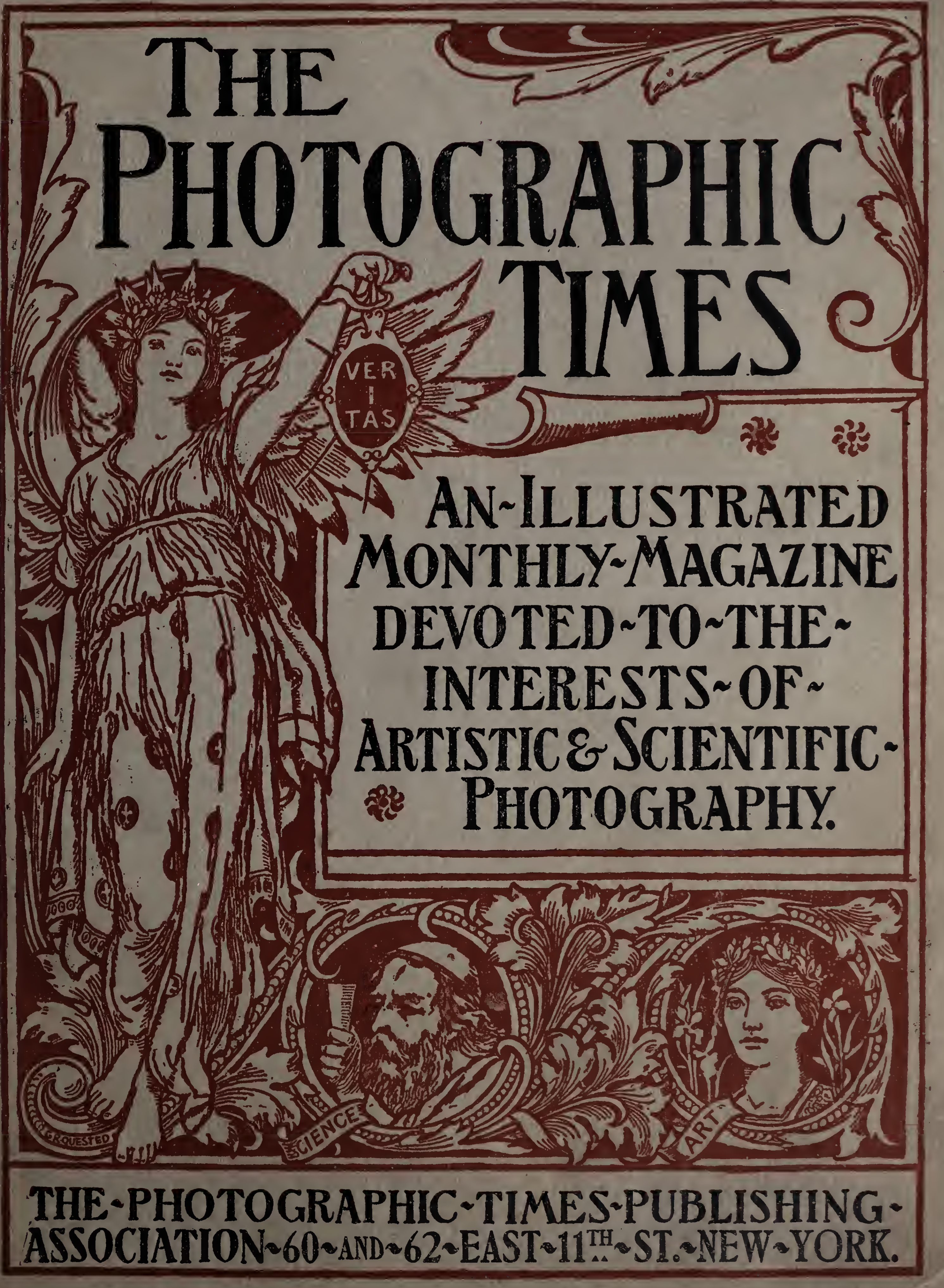
Trade Agents:
E. & H. T. Anthony & Co.,
New York and Chicago.

Vol. XXX.
FOUR DOLLARS PER ANNUM.

AUGUST, 1898.

Number 8.
SINGLE COPIES, 35 CENTS.

THE PHOTOGRAPHIC TIMES



AN ILLUSTRATED
MONTHLY MAGAZINE
DEVOTED TO THE
INTERESTS OF
ARTISTIC & SCIENTIFIC
PHOTOGRAPHY.

THE PHOTOGRAPHIC TIMES PUBLISHING
ASSOCIATION 60 AND 62 EAST 11TH. ST. NEW YORK.

CONTENTS

PAGE

Frontispiece—Early Morn.—By Alfred Stieglitz.

New Military Subjects—By Maximilian Toch....... 337

"Outside the Lines"—By Maximilian Toch—Illustration........... 337

Resting—By Maximilian Toch—Illustration........ 338

"Luxury Row"—By Maximilian Toch—Illustration 338

Cooking Supper—By Maximilian Toch—Illustration 339

Paris Photographic Salon, 1898—By Charles Rinaldo King (Paris)........ 339

A Photographic Trip to the Island of Mackinac, Mich.—By L. P. Gratacap.................... 340

Road Through Woods, Island of Mackinac—Illustration.......... 341

English Landing, Island of Mackinac—Illustration. 341

Sugar Loaf, Island of Mackinac—Illustration....... 342

Mackinac, Island of Mackinac—Illustration......... 343

Fort Mackinac, Island of Mackinac—Illustration... 344

Woodland Vows—By Nicolai—Illustration......... 345

Catching Clouds—By Osborne I. Yellott........... 346

Anticipation—By John H. Tarbell—Illustration..... 346

The Crest of the Hill—By C. F. Inston—Illustration 347

"Shut In," Arcadia, Mo.—Illustration............ 348

The Occult in Photography—By R. D. O. Smith—Illustration.......... 349

November Morning—By W. P. Walker—Illustration 350

The Carbon Process—By P. C. Duchochois........ 351

Willows at Twilight—By Leon W. Shaw—Illustration......... 351

Suffolk Marshes—By Carl Greger—Illustration..... 352

Sunshine and Smoke—By Edgar E. Lee—Illustration.......... 353

An Ominous Evening—By B. C. Wickinson—Illustration........ 354

PAGE

Photographic Studies of Some American Owls—By Dr. R. W. Shufeldt, C.M.Z.S.................. 355

The Great Horned Owl—By Dr. R. W. Shufeldt—Illustration........ 356

American Barn Owl—By Dr. R. W. Shufeldt—Illustration......... 357

Screech Owl—By Dr. R. W. Shufeldt—Illustration. 358

Naturalistic Photography—By P. H. Emerson, B.A., M.B. (Cantab)........ 359

In a Garden Fair—By J. Craig Annan—Illustration 361

The Use of Two Stops During One Exposure—By C. A. T. Middleton, A.R.I.B.A.......... 363

Wild Black Raspberry—By H. Troth—Illustration. 363

Toning Bromide Prints—By Edmund A. Robins... 364

Gum-Bichromate Prints at the Salon—By Robert Demachy........ 365

Portrait Study—By Chas. I. Berg—Illustration..... 365

Inside a Water-Pipe—Illustration.................. 367

A Couple of Suggestions—By Ellerslie Wallace.... 368

Child Study—By G. Appleton—Illustration........ 368

The Sweet Potato Field—By R. Eickemeyer, Jr.opp. 368

Bicycle and Camera—By Francis Barklie..... 369

Editorial Notes.......... 371

A Distorted Photograph—Illustration.............. 372

Light and the Work it Does—By R. Child Bayley.. 373

Process Reproduction from an Editor's Point of View—By Wallace L. Crowdy................ 374

Notes and News.......... 379

Patents of the Month.......... 384

THE ENCYCLOPÆDIC DICTIONARY OF PHOTOGRAPHY.......... 505

INSOLUBLE AND NONCURLING,

STRICTLY FIRSTCLASS IN EVERY RESPECT.

THE GETTY CENTER

NOW READY

A Photographic Library in one Volume.

THE

Encyclopædic Dictionary of Photography.

By

WALTER E. WOODBURY,

Editor, The Photographic Times.

Contains over

2000 References and 600 Illustrations.

A Definition of Every Word used in Photography. Every Photographic Process described. Hundreds of formulæ.

PRICE, (in Handsome Cloth Binding,) - - - - - $5.00.

Of all Photographic Dealers, Booksellers, etc.,

or from the Publishers,

The Scovill & Adams Company of New York,

60 & 62 East 11th Street, New York.

KINDLY MENTION THE PHOTOGRAPHIC TIMES.

SECOND EDITION - - THIRD THOUSAND.

"Sunlight and... Shadow"

A BOOK FOR PHOTOGRAPHERS,

.....AMATEUR AND PROFESSIONAL.....

By W. I. LINCOLN ADAMS.

Containing Chapters and Illustrations by such well-known photographic writers and workers as

H. P. ROBINSON,
ALFRED STIEGLITZ.
A. HORSLEY HINTON,
R. EICKEMEYER, Jr.,
W. B. POST,
J. WELLS CHAMPNEY,
B. J. FALK,
ALEXANDER BLACK,
W. A. FRASER,
HER GRACE THE DUCHESS OF SERMONETA,
and the MARQUIS DE ALFARRAS.

It covers the field entirely, as shown by the following

Contents

THE CHOICE OF SUBJECT.
LANDSCAPE WITHOUT FIGURES.
LANDSCAPE WITH FIGURES.
FOREGROUNDS.
THE SKY.
OUT-DOOR PORTRAITS AND GROUPS.
THE HAND CAMERA.
INSTANTANEOUS PHOTOGRAPHY.
WINTER PHOTOGRAPHY.
MARINES.
PHOTOGRAPHY AT NIGHT.
LIGHTING IN PORTRAITURE.
PHOTOGRAPHING CHILDREN.
ART IN GROUPING.

About 150 pages of the most instructive and entertaining reading matter,

....AND....

: : : : *More than 100 Beautiful Photo Engravings* : : : :

MANY OF THEM FULL-PAGE PICTURES.

Printed on Heavy Wood-cut Paper, with liberal margins and gilt edges.
Beautifully and Substantially bound in Art Canvas, with gilt design.

PRICE, IN A BOX. $2.50

Sent post free by mail, to any address, on receipt of amount by

The Scovill & Adams Company of New York,

60 and 62 East Eleventh Street, New York City.

The S. & A. Photographic Series.

No.	Title	Price per copy.
No. 5.	**Photography with Emulsions.** By CAPT. W. DE W. ABNEY, R.E., F.R.S. A treatise on the theory and practical working of Gelatine and Collodion Emulsion Processes. (Second Edition.) Paper covers	75
No. 7.	**The Modern Practice of Retouching.** As practiced by M. Piquepé, and other celebrated experts. (Ninth Edition.) Paper Covers	50
No. 8.	**The Spanish Edition of How to Make Pictures.** Ligeras Lecciones sobre Fotografia Dedicados a Los Aficionados. Cloth bound, 75 cents. Paper covers	50
No. 12.	**Hardwich's Photographic Chemistry.** A manual of photographic chemistry, theoretical and practical. Ninth Edition. Edited by J. TRAILL TAYLOR. Leatherette binding	2 00
No. 13.	**Twelve Elementary Lessons on Silver Printing.** (Second Edition.) Paper covers	50
No. 14.	**About Photography and Photographers.** A series of interesting essays for the studio and study, to which is added European Rambles with a Camera. By H. BADEN PRITCHARD, F.C.S. Paper covers	50
	Cloth bound (Library Edition)	75
No. 15.	**The Chemical Effect of the Spectrum.** By Dr. J. M. EDER. Cloth bound, 50 cents. Paper covers,	25
No. 21.	**The American Annual of Photography and Photographic Times Almanac for 1887.** (Second Edition.) Paper cover; (postage, 12 cents additional)	50
	Library Edition; (postage, 12 cents additional)	1 00
No. 22.	**Photographic Printing Methods.** By the Rev. W. H. BURBANK. A Practical Guide to the Professional and Amateur Worker. Paper. (Third Edition)	1 00
No. 23.	**A History of Photography.** Written as a practical guide and an introduction to its latest developments. By W. JEROME HARRISON, F.G.S., and containing a frontispiece of the author. Cloth bound	1 00
No. 24.	**The American Annual of Photography and Photographic Times Almanac for 1888.** Illustrated. (Second Edition.) Paper; (by mail, 12 cents additional.)	50
	Library Edition; (by mail, 12 cents additional)	1 00
No. 25.	**The Photographic Negative.** A Practical Guide to the Preparation of Sensitive Surfaces by the Calotype, Albumen, Collodion, and Gelatine Processes, on Glass and Paper, with Supplementary Chapter on Development, etc., by the REV. W. H. BURBANK. Cloth bound. Reduced from $1.50 to	1 00
No. 26.	**The Photographic Instructor for the Professional and Amateur.** Being the comprehensive series of Practical Lessons issued to the Students of the Chautauqua School of Photography. Revised and enlarged. Edited by W. I. LINCOLN ADAMS, with an Appendix by Prof. CHARLES EHRMANN. (Fifth Edition, enlarged and revised.) Paper Covers	1 00
No. 27.	**Letters on Landscape Photography.** By H. P. ROBINSON. Finely illustrated from the Author's own photographs and containing a Photogravure Frontispiece of the Author. Cloth bound	1 50
No. 29.	**The Processes of Pure Photography.** By W. K. BURTON and ANDREW PRINGLE. A standard work, very complete and freely illustrated. Price, in paper covers, $2.00. Library Edition	2 50
No. 30.	**Pictorial Effect in Photography.** By H. P. ROBINSON. A new edition. Illustrated. Mr. Robinson's first and best work. Cloth bound	1 50
No. 32.	**Practical Photo-Micrography.** By ANDREW PRINGLE. Fully illustrated Cloth bound	$2 50
No. 33.	**The American Annual of Photography and Photographic Times Almanac for 1890.** Paper cover (by mail, 14 cents additional)	50
	Library Edition (by mail, 14 cents additional)	1 00
No. 34.	**The Optical Lantern.** Illustrated. By ANDREW PRINGLE. In paper covers	1 00
	Cloth bound	1 50

The S. & A. Photographic Series.

(Continued.)

	Price per copy.
No. 35. **Lantern-Slides by Photographic Methods.** By ANDREW PRINGLE. In paper covers	75
Cloth bound	1 25
No. 36. **The American Annual of Photography and Photographic Times Almanac for 1891.**	
Paper cover (by mail, 15 cents additional)	50
Library Edition (by mail, 15 cents additional)	1 00
Cyclopedic Index for 1891 Annual	10
No. 37. **Photographic Optics.** A Text Book for the Professional and Amateur. By W. K. BURTON. Paper	1 00
Library Edition	1 50
No. 38.—**Photographic Reproduction Processes.** Illustrated. By P. C. DUCHOCHOIS. Paper	1 00
Cloth	1 50
No. 39. **El Instructor Fotografico.** Paper covers, $1.00 Library edition	1 50
No. 41. **The Chemistry of Photography.** By W. JEROME HARRISON. Cloth bound	3 00
No. 42. **Picture-Making in the Studio.** By H. P. ROBINSON. Paper	50
Cloth bound (Library edition)	1 00
No. 43. **The American Annual of Photography and Photographic Times Almanac for 1893.**	
In Paper covers. Postage, 15 cents extra	50
Cloth bound (Library edition). Postage 15 cents extra	1 00
No. 44. **The Lighting in the Photographic Studio.** By P. C. DUCHOCHOIS. A new edition. In paper covers	75
Cloth bound (Library edition)	1 00
No. 45. **The Grammar of Photo-Engraving.** By H. D. FARQUHAR. Illustrated. The most complete text book yet published on this subject. Price, in paper covers	2 00
Cloth bound (Library edition)	2 50
No. 46. **Industrial Photography.** Illustrated. By P. C. DUCHOCHOIS. Being a description of the various processes of producing Indestructible Photographic Images on Glass, Porcelain, Metal, and many other substances. Paper Covers, 50 cents. Cloth bound	1 00
No. 47. **The American Annual of Photography and Photographic Times Almanac for 1894.** Edited by W. I. LINCOLN ADAMS. In Paper Covers. Postage, 15 cents extra.	50
Cloth bound (Library Edition). Postage, 15 cents extra	1 00
No. 48. **Aristotypes, and How to Make Them.** Giving a complete description of the manufacture and treatment of Gelatino and Collodio-Chloride Papers. By WALTER E. WOODBURY. Illustrated. In Paper Covers	1 50
Cloth bound (Library edition)	2 00
No. 49. **The Encyclopedic Dictionary of Photography. Containing ovor 2,000 references and more than 500 illustrations. The completest work of the kind ever issued. By Walter E. Woodbury, Editor of the Photographic Times.** In cloth	5 00
No. 50. **The American Annual of Photography and Photographic Times Almanac for 1895.** With over 200 illustrations. Edited by WALTER E. WOODBURY, Editor of "The Photographic Times." In Paper Covers. Postage, 15 cents extra	50
Cloth bound (Library Edition)	1 00
No. 51. **The Photo-Gravure.** By HENRY R. BLANEY. A very complete and practical book, written by an Expert. In paper covers, 50 cents. Cloth bound (Library edition)	1 00
No. 53. **The Annual, '96.** "The American Annual of Photography and Photographic Times Almanac for 1896," with 200 illustrations. Edited by WALTER E. WOODBURY, Editor of THE PHOTOGRAPHIC TIMES. In paper cover, 75 cents; in cloth bound	1 25
No. 54. **Half-Tone by the Enamel Process.** By ROBERT WHITTET. Fully illustrated and very complete. Price, in paper cover, 50 cents. Library edition	1 00
No. 55. **Instantaneous Photography.** By Capt. Abney, the great authority. Price in paper covers	75
No. 56. **Photographic Amusements.** By WALTER E. WOODBURY, Editor of THE PHOTOGRAPHIC TIMES Third edition, including a number of novel and curious effects obtainable with the camera. In paper covers, $1.00. Cloth	1 50

For sale by all dealers in Photographic goods, booksellers, and sent, postpaid, on receipt of price, by the publishers,

THE SCOVILL & ADAMS CO. OF NEW YORK,
60 and 62 East 11th Street, New York.

A Selected List of Books

From the Scovill & Adams Co. of New York Book Catalogue.

	Price per copy
Amateur Photography. A Practical Guide for the Beginner. By W. I. Lincoln Adams. Illustrated. Paper covers, 50c.; cloth bound	$1 00
Lantern Slides and How to Make Them. By A. R. Dresser. A new book, very complete and practical	25
Photography at Night. By P. C. Duchochois. Illustrated. 108 pp. Paper covers	1 00
The Knack. Written expressly to help the beginner in perplexity, reduced to	25
Photographic Lenses; Their Choice and Use. By J. H. Dallmeyer. A special edition, edited for American photographers. In paper covers	25
The Chemistry of Photography. By Prof. Raphael Meldola	2 00
The Photographic Image. By P. C. Duchochois. A Theoretical and Practical Treatise on Development. Paper covers	1 50
Cloth bound	2 00
The Ferrotyper's Guide. For the ferrotyper, this is the only standard work. Seventh thousand	75
The Photographic Studios of Europe. By H. Baden Pritchard, F.C.S. Cloth bound, $1.00; paper covers	50
History and Hand-Book of Photography. With seventy illustrations. Cloth bound, reduced to	50
Crayon Portraiture. Complete instructions for making Crayon Portraits on Crayon Paper and on Platinum, Silver and Bromide Enlargements; also directions for the use of Transparent Liquid Water Colors, and for making French Crystals. By J. A. Barhydt. A new edition. Paper covers	
Cloth bound	1 00
Art Recreations. Ladies' popular guide in home decorative work, with a chapter on photography. Edited by Marion Kemble	1 00
The Photographer's Book of Practical Formulas. Compiled by Dr. W. D. Holmes, Ph.B., and E. P. Griswold. Paper covers, reduced from 75c. to 30c.; cloth bound, reduced from $1.50 to	60
American Hand-Book of the Daguerrotype. By S. D. Humphrey. (Fifth Edition.) This book contains the various processes employed in taking heliographic impressions	25
"Sunlight and Shadow" a book for Photographers, Amateurs and Professionals. By W. I. Lincoln Adams. Illustrated with over 100 handsome photo-engravings. Beautifully and substantially bound. Price in a box	2 50

Platinum Printing

A New Edition

(The Second)

OF "THE PLATINOTYPE"

BY CAPT. ABNEY

NOW READY

The most complete book on this subject published

PRICE $1.25

Sent postpaid on receipt of price by the publisher

THE SCOVILL & ADAMS CO. OF N. Y.

60 and 62 East 11th Street, New York.

KINDLY MENTION THE PHOTOGRAPHIC TIMES.

CURRENT LITERATURE CURRENT LITERATURE CURRENT LITERATURE CURRENT LITERATURE

CURRENT LITERATURE CURRENT LITERATURE

CURRENT LITERATURE CURRENT LITERATURE

CURRENT LITERATURE CURRENT LITERATURE CURRENT LITERATURE CURRENT LITERATURE

Current Literature

has never been anything but a delightful publication since the appearance of its first number. For the busy people who cannot read all the periodicals, or the family with the limited pocketbook, who can afford only one or two each month, *Current Literature* is an inestimable blessing, selecting and reprinting, as it does, the best things of the month. There is a charm in the very make-up of the magazine which is altogether distinctive."—*Art in Advertising.*

25 cts. a Copy. $3.00 a Year.

For Sale on all News Stands.

CURRENT LITERATURE,
Bryant Building, New York.

ARE YOU A SUBSCRIBER

TO THE

St. Louis & Canadian Photographer?

NO?

WELL, YOU ARE BEHIND THE TIMES.

Send 50 Cents at once for a

3 MONTHS' TRIAL TRIP.

EVERY NUMBER HANDSOMELY ILLUSTRATED.

Amateurs like it. Professionals cannot do without it.

"I wish you success in the new Editorship, and hope that the good work of the Journal will go on, and that it will still continue to uphold and build up the legitimate photo business."

C. P. McDANNELL,
Cambridgeboro, Pa.

"Why, of course, we wish to renew. You would not expect us to try and run business without it."

E. LONG & SON,
Quincy, Ill

$3.00 per Year, $1.50 for Six Months.

Mrs. FITZGIBBON-CLARK,

2714 Olive St., ST. LOUIS, MO.

SUBSCRIPTIONS RECEIVED BY ALL DEALERS.

INTERESTED IN ELECTRICITY?

Read The Electrical Engineer.

Published Weekly. Fully Illustrated. All the News.

The issues in May contain complete description of the Electrical Exhibition held at Madison Square Garden during the month, with illustrations of different exhibits and an interesting account of the proceedings.

The June numbers will report the proceedings of the National Electric Light Association Convention, and the meetings of other Associations held during the month.

Sample Copy Free.

THE ELECTRICAL ENGINEER,

SEND FOR BOOK CATALOGUE. **120 Liberty St., New York.**

EVERY GOOD PHOTOGRAPHER

Delights in good printing. Send for a copy of

The Printer and Bookmaker,

a journal devoted to Printing, Engraving, Illustrating, Book-making, Etc. It is pleasing to the eye, and instructive to the mind.

SUBSCRIPTION PRICE, $1.00 PER YEAR.

HOWARD LOCKWOOD & CO.,
143 Bleecker Street, New York.

SUBSCRIPTION FORM.

THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION,
60 and 62 East 11th Street, New York,

Gentlemen: Please send THE PHOTOGRAPHIC TIMES

for.................... year, commencing.................... 189 , for which

I enclose.................... dollars.

Name....................

Address....................

....

The Leading Photographic Magazine of the World.

TERMS CASH.—To avoid all risks, we prefer remittances by Express, Money Orders, Draft on New York, Post Office Money Orders, Postal Notes, or Registered Letter.

WILSON'S QUARTER CENTURY IN PHOTOGRAPHY

By EDWARD L. WILSON.

A complete text-book of photography for the beginner and expert; plainly written, with the experience of over three hundred authorities, covering all branches of photographic work, theory, and practice, with many illustrations. A complete photographic education; indispensable to all interested in photography; full of valuable information; thoroughly boiled down and concisely presented.

528 closely printed pages: 280 illustrations.

SEVENTH THOUSAND NOW SELLING. ——PRICE, $4.00. POST FREE.

EDWARD L. WILSON, 853 BROADWAY, NEW YORK.

The Victorian Classic

A Classic of Literature; a Classic of Friendship; a Classic of Consolation; a Classic of Literary and Artistic Interpretation.

Tennyson's In Memoriam

Critical Preface by HENRY VAN DYKE.
Exquisitely Illustrated by HARRY FENN.
Elegantly printed, bound in silk, boxed, $3.50.

"Unquestionably the greatest poem of the century. It contains the deepest thought, the tenderest affection, the holiest aspiration, of the chief English poet of our time. . . The present volume is a worthy setting for such a noble work. . . A classic edition of a great classic."—*N. Y. Observer.*

"A classic of Friendship. Dr. VAN DYKE says: He turns back to trace the pathway of friendship, and remembers how love made it fair and sweet, doubling all joy and dividing all pain."—*Preface to this Edition.*

"A classic of consolation. . . For one who seeks a gift for a friend in sorrow, nothing could be more beautiful and appropriate."—*The Church Economist, N. Y.*

"Mr. FENN knows the Tennyson landscape of old, and he drew these studies on the spot. As mere adornments they are exquisite, bu they are true interpretations, greatly enhancing the point of the verse."—*The American, Philadelphia.*

FOR SALE BY

THE SCOVILL & ADAMS CO. OF N. Y., 60 and 62 East 11th St., N. Y.

PHOTO ERA

An Illustrated Monthly Magazine of Progress
. . in the Science and Art of Photography . .

An up-to-date publication for Amateurs and Professionals.

Exceeds in beauty anything heretofore attempted in photographic publications.

Reproductions in Color, in Photogravure, in Heliotype and in Halftone-monotones.

15c. per copy.

Something you can keep for all time.
Something you can learn from.
Something entirely original.

$1.50 per year.

SEND FOR A SAMPLE COPY TO

.....Photo Era Publishing Company.....
180 Tremont Street, Boston, Mass.

First and second Edition Sold Out within a few months.

THIRD EDITION NOW READY.

"Photographic ◆ ◆ ◆ ◆ Amusements"

By WALTER E. WOODBURY,
Editor of "The Photographic Times."
and "The American Annual of Photography."

Containing a Description of

A Number of Photographic Experiments and Novel Effects to be obtained with the Camera.

Invaluable to both the Amateur and Professional Photographer.

OVER ONE HUNDRED ILLUSTRATIONS.

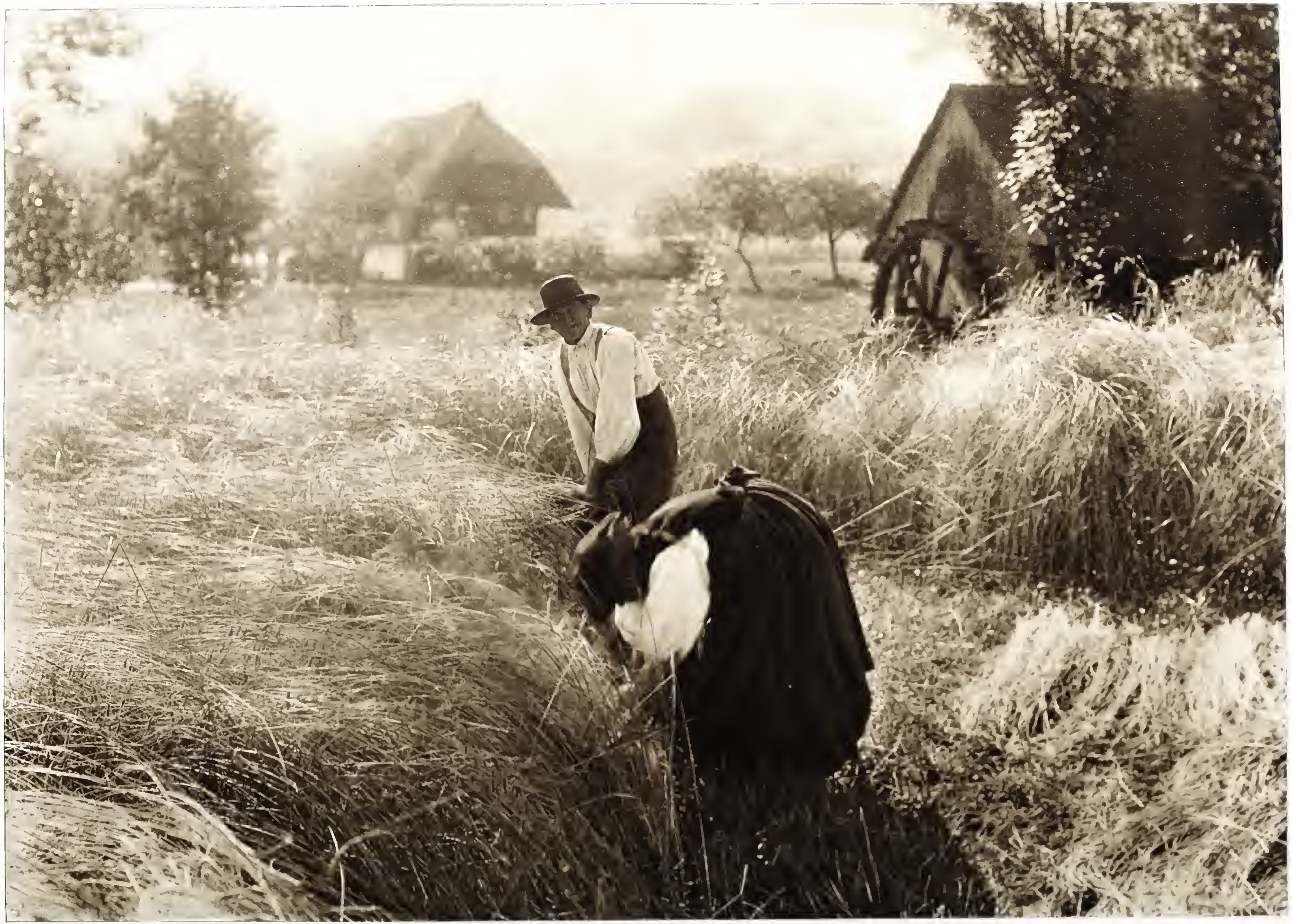
Price, in Paper Covers, $1.00. Cloth, $1.50.

Sent post paid on receipt of price by the Publishers,

THE SCOVILL & ADAMS COMPANY OF NEW YORK,
60 and 62 East Eleventh St., New York, N. Y.

SEND FOR NEW CATALOGUE OF PHOTOGRAPHIC PUBLICATIONS.

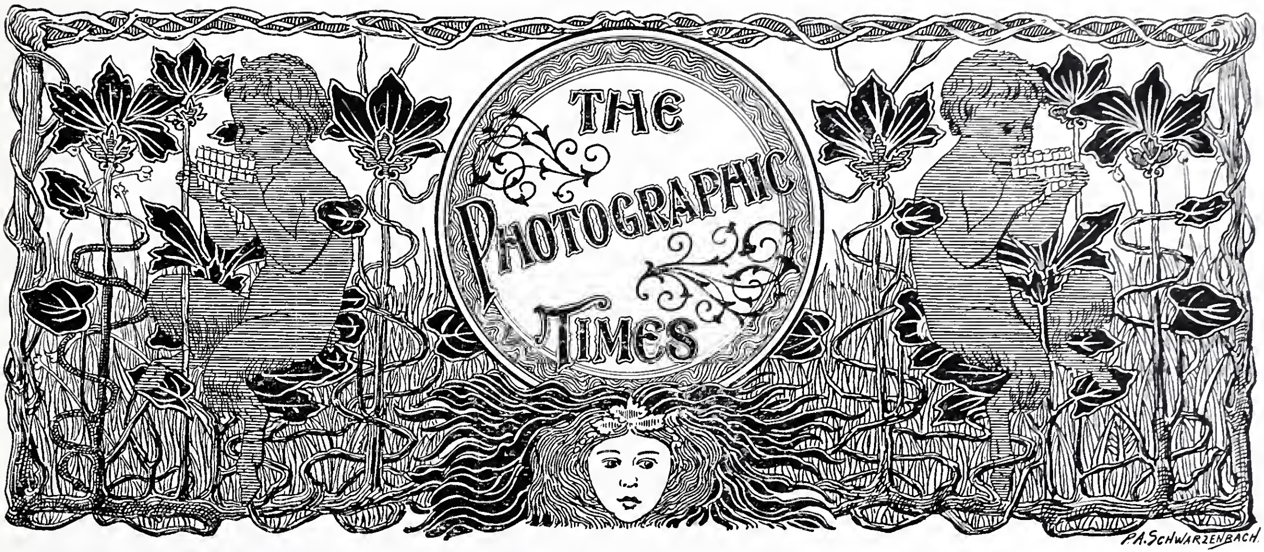
KINDLY MENTION THE PHOTOGRAPHIC TIMES.



GRAVURE-PHOTOCHROME ENG. CO. NY.

EARLY MORN

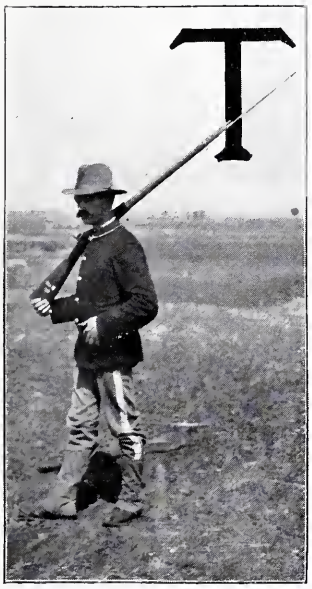
BY ALFRED STIEGLITZ



VOL. XXX. AUGUST, 1898. NO. 8.

NEW MILITARY SUBJECTS.

BY MAXIMILIAN TOCH.



THE troops in camp afford many interesting new and unique subjects for the amateur photographer. It is not exactly necessary to advertise this, as the camps seem to be overrun with amateur and professional photographers.

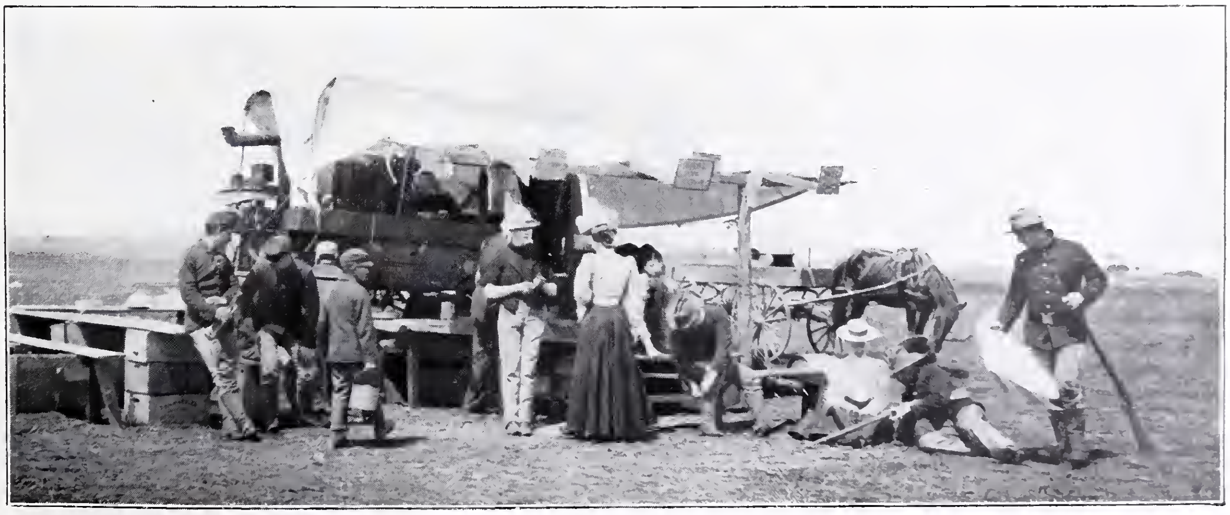
The regulation picture of the soldier with the girl he left behind poses all over, but the sutlers' tents, the cook house and the sentries are overlooked.

Outside the lines are stationed temporary structures of all kinds where soldiers can buy "Pizen things." Sentries on duty generally suspend military orders when they see a soldier scurrying toward these places. At the end of each company's street is a cook house where the meals are prepared. Every thing seems to be boiled in this place, and the coffee most of all.

The circular tents accommodate ten to fifteen men, and usually a dog or a pig. These pets are taken along as mascots, but it does not seem to make any difference to the soldiers what the mascots are as long as they are alive.

The officers appear to live very comfortably, but no comfort would be too much for the private who volunteers to serve his country.

Time exposures are of little avail in photographing camp life There is such a hurrying to and fro, there are so many ready to poke



"OUTSIDE THE LINES" BY MAXIMILIAN TOCH

Copyright. 1897, by The Scovill & Adams Co. of New York. Entered as Second Class Matter at the New York, N. Y., Post Office.

their noses into the lens, and there is such a vast amount of forced posing, that the quicker a picture be taken the better.

In the picture called "Outside the Lines," the exposure was made while the subjects were all getting ready to have their pictures taken.

RESTING BY MAXIMILIAN TOCH

"LUXURY ROW" BY MAXIMILIAN TOCH

COOKING SUPPER BY MAXIMILIAN TOCH

PARIS PHOTOGRAPHIC SALON, 1898. BY CHARLES RINALDO KING (Paris).

ARTISTIC or pictorial photography as exemplified at this year's salon is, on the whole, nearly as good as that we were shown in 1896. Less crazy than the funereal exhibition of 1897, and certainly far finer as regards the very style of pictures which in 1896 rendered the exhibition ridiculous to everyone. I refer to the experiments (for they were nothing better) in bichromated gum, for this year many of the "gums" are far and away incomparably superior to the out-of-focus, fogged, dispiritingly dismal brown carbons of English origin with which the 1896 exhibition was spoilt in a measure.

Just as the English pictures appear to display, by reflection, jaundice with their authors, so this year the Teutonic element bursts out into rainbow colors of the most vivid (and sometimes multicolored) hues, strongly tied to the English style, however, by the absolute want of detail and the extreme diffusion of outline as to make it necessary to imagine the image which is intended from the title found in the catalogue!

While the French display the greatest originality in the *pose* of animated subjects, and, on the whole produce more decorative pictures than the English with their present rich graspings after idiosyncratic expression, the Swiss, as usual led by M. Boissonnas, can lay claim to the nearest approach to photography as a fine art.

America, as represented here, has entirely escaped from the degraded cravings of English "dabsters," and her prints are clean, bright, often decorative, and very often indicate a good understanding of the rules which govern in the production of artistic pictures.

This is very satisfactory, for it is obvious that the mistaken efforts made by those who attempt to whip an "art temperament" into their sadly-blurred and befogged papers, only retard the progress of pure photography. Yet, in all justice, it must be admitted that the crazy school is on the ebb if the present salon is any indication of the world's work.

On entering the salon most people are struck by the polychromatic views of H. Henneberg, of Vienna. One entitled "Poplars," is in blue, green, and yellow gums, and another, "Study in green and brown," is also a landscape. The nine "studies" by this author are all by the gum process, and attracted much attention. One's only regret is that the experimenter had pushed the present craze for blotching to such an extreme.

It is from Germany that have emanated the larger number of vivid-hued pictures. Very strange are the "gums" by T. O. Hofmeister. The "Apple Harvest," in sage-green, is very fair work, but other pictures in ultramarine blue appear with evidently "faked" lines, imitating, presumably, the leaded beadings of stained-glass windows, while the subjects are posed languidly, with a passable attempt to imitate Puvis de Chavannes. Although "dodging" on the negative or print shows commendable pains to do something original, yet it will never arrive at anything so good as could be effected with half the labor with brush colors and a clean sheet of paper.

Of all the "muffy" attempts, certainly the softest and yet clearest are those by Dr. Julius Strakosch, of Hohenau, Lower Austria. Of eight pictures shown by him, all in platinotype, "By the Side of the Pond," representing some barns and houses by the water-side, in purple colors, and "The Old Tower," a somewhat similar landscape in sepia tint, and both on rough paper, are the most brilliant. If such out-of-focus effects are desirable, then this author might be imitated with advantage by others.

A remarkable "Study," in platinotype, of a woman in long black drapery, is exhibited by Countess Marie Oriola, of Büdesheim, Germany. The *finesse* and intensity of the contrasts are so remarkable as to appear almost stereoscopic.

Since landscapes form the majority of pictures exhibited, it is natural that green should be used very extensively, but the variety and brilliance of the shades employed this year are, not disagreeably, surprising. Thus, H. M. Gehrkens, of Hamburg, in some very fine specimens of the gum process, has at least three brilliant blue-green hues, entitled "In Sweden," "The Lake of Hertha," and "A Game Forest." F. Behrens, of Rogasen-Posen, Germany, has a green "Forest," and a blue "Eventide," by the same process. Blue, of "Rickett's" cast, is used by G. Einbeck, of Hamburg, in his "gums" entitled "Silence" and "Solitude."

Drouet, of Paris, shows the "Bois de Chaville," tall birches overhanging a sheet of water—a picture in which the delicate tracery of the branches makes the composition interesting, as it could not have been treated "à la fuzzy"; and the "Stone Plank at Cricquebeuf," although merely showing a plank over a stream, a palisading and gate, and cattle in the distance, yet the wealth of fine rustic detail has been a good excuse for the production. Both are in Artigue carbon.

Klary, also of Paris, exhibits a very fine study of a bearded old man lighting his pipe, entitled the "Old Model," and F. R. Pineiro, of Paris, has a "Sculptor of the Middle Ages," a long-bearded old man, dressed in velvet costume, seated before a table, engaged in chiseling a wooden figure.

There are two very fine snow scenes worth noting: "Hoar Frost and Mist," a soft bromide enlargement, by P. Mantelier, of Tours, and "Decline of the Day," an enlarged carbon, by E. Sacré, of Ghent, showing a dreary-looking road, bordered by trees, leading to a small village, which commences abruptly a short distance off.

A. Lemoine, of Paris, shows nude studies—carbon enlargements. The "Study," a woman kneeling by the rocky side of a river, and the "Torrent Nymph," are the most remarkable.

Good photography, but no longer in the fashion, are the two striking pictures of P. MacDonald, of Albany, U. S. A.: "A Portrait of a Lady," shows a face of exquisitely fine modeling but suggestive of the retoucher's work, and "A Lady and Child,"—three-quarter lengths against a dark background—strike one, both as regards pose and fine finish, as being among the most pleasing of portraits exhibited, though, perhaps, a little conventional.

The "Housatonic Valley," and "Looking at the Clouds," are two charming pictures by C. R. Pancoast, of Philadelphia; thanks to the natural scenery depicted—long, undulating hills, stretching away into the distance, with a winding river between—in one picture a lady is introduced looking away from the observer, to lend effect to the distance

A. Stieglitz, of New York, exhibits a curious picture, called "Night Reflections," representing tall buildings, with their scores of illuminated windows reflected upon either a sheet of water or a wet street-way. The paper being of reddish hue gives striking effect to the high lights.

A PHOTOGRAPHIC TRIP TO THE ISLAND OF MACKINAC, MICH.

BY L. P. GRATACAP.

The increased conveniences of travel on the lakes in the sumptuous and also dainty accommodations of the Northern Steamship Company, makes the tour of the Great Lakes increasingly attractive. From Buffalo to Duluth, through the tortuous channels of the St. Mary, Detroit, and St. Clair rivers, over the long distances in the great lakes themselves, in weather not invariably pleasant and over waters not invariably smooth, would prove to most tourists not an altogether pleasurable trip. The course of the steamers, far from land, the average lowness of the shores, the absence of notable features except in a few remarkable instances, as the "Little Venice," the Rapids of the "Soo," the locks at the Sault Ste. Marie, the wooded islands and sinuous courses from Sault Ste. Marie to Detour, on Lake Huron, and the later episodes of the canal through Keweenaw peninsula, or the devious threadings of the Apostles' islands, exacts from the method and means of conveyance large provisions for comfort and amusement.

With surroundings that are pleasing and delightful, and such accompaniments to bodily

ROAD THROUGH WOODS, ISLAND OF MACKINAC

ease as music, capacious chairs, wide decks, and such aids to diversion as reading and cards, the "waste of waters," especially if it is a sunlit mirror, only affords delicious interludes of reflection and conversation, or stimulating efforts at amusement, and the separated "events" of the lake transit are then awaited without impatience, and enjoyed without excitement.

The Northern Steamship Company, conscious of the frailty of the average human body and the caprice and insufficiency of the average human mind, has built beautiful steamers, superbly arranged and equipped them, secured a faultless cuisine, interjected music, and converted their physical features into an harmonious tribute to the self-indulgence of the traveler.

It was not the fortune of the writer to enjoy this luxurious mode of traveling, though he speaks of it with no sense of regret. It is an ideal and happily conceived relief from some of the irksome features of less expensive lines, but it would be grossly unjust to the admirable management of the Erie Transportation Company, and their comfortable, safe, and generally adequate steamers — the Japan, India, and China—to raise any unnecessary and invidious comparison.

ENGLISH LANDING, ISLAND OF MACKINAC

In this long trip over the "inland seas," apart from those impressions of wonder at the immensity of the lakes themselves, and of admiration at the endless and crowded stream of navigation by which they are traversed, one recollection stands out in a sharp focus of beauty and pleasure. It is Mackinac, the small island six miles from the Straits of Mackinac, where Lakes Huron and Michigan, like coalescing bubbles, press through the narrowing neck of land between Upper and Lower Michigan. We approached this island under circumstances particularly conducive to an impression of memorable interest.

On leaving Port Huron the night settled down cold and rainy, and the dark waters, petulant under the attacks of wind and weather, beat our vessel with some violence. The next day was passed steaming over the dull tract of waves, with no light in the skies, and only the welcome reiteration of meals to bring relief to our dejection. Books seemed an ineffectual solace, and our mutual companionship a trifle stupid.

But in the afternoon nature relented; we were then in sight, at a long distance, of the bluffs of Mackinac. Almost indistinguishably, a hummock rose on the horizon, lifting its welcome walls above the flat sky-line, and the changing wind began to clear

SUGAR LOAF, ISLAND OF MACKINAC

the air, and bring together, in effective masses, the distributed fields of vapor. The process of preparation begun, the work went on rapidly and wisely.

Strips of blue were stretched across the middle sky distances, and in front of them were drawn imposing ranges of radiant cumulus resting on ashy stratus; the sun was summoned to illuminate the scene, the wind was withdrawn, or intermittently permitted to ruffle the lake with a rushing flight of ripples, and in the higher altitudes to play upon the cloud masses, rearranging them slightly, and imparting such motion as would diversify the lights and shades with changing shadows. The island itself was partially flooded with light and partially darkened with shadow, so that the creeping village at the water's edge sprang out in the highest relief, the fort clambering along the edge of the cliff rose again brilliantly above it, but the tree bunches seemed richly tinted in darkest green, and a reciprocal cold blueness of cloud and sky was pushed adroitly behind the island's outlines to the right and left. Some details were hurried forward in the foreground, as a circular raft of logs butted and pulled by two propellers, whose steam rose in snowy currents, while metallic reflections were painted on the receding swirls of boiling water.

The results of this scenic improvisation were appreciated and applauded. The elements of beauty were unmistakable, and the strong, exciting features of color produced by the disappearing storm equally evident. The passengers hung over the railings of the steamer as she drew nearer and nearer to the beautiful spot, in mute admiration. It was not just right for effective snap work, the light was too wayward and peculiar also for landscape effects, as the writer believes in time pictures, the motion of the steamer was prohibitory. We all, who lugged cameras with us, wished Chassagne, or anybody else for that matter, had told the truth about color photography. The color was the best part of the picture.

We drew up to the wharf, in full view of the picturesque fort, white, with irregular barracks, and, admirably disposed for pictorial effect, block houses, flanking the façade, its whitewashed walls, and the long, slanting approach from the shore, up which some figures were then ascending. At the landing the scene was one of animation and variety; baggage and passengers moving landward in divergent streams, the incessant attacks of cabmen, the loitering spectators, the approach from Mackinac City of a ferry-boat suggestive in form of a wash-basin, the receding carriages, and the slow entrance of a sister ship coming from the north, all compacted in a limited space, presented an exhilarating picture not without its vocal accompaniment of voices, shrill, plaintive, or discordant. Here were incomparable chances, and snap, snap, snap, went the insidious shutters as, one after another, we caught some character sketch for home uses.

The little village of Mackinac, the only settlement on the island, occupies an extended triangular or crescentic space, reaching from Grand Hotel and neighboring villas at the extreme west, to the villas near the point of rocks called Robertson's Folly, on the extreme east. It forms a rather pleasing picture with the spire of the Cathedral, its white hotels and boarding houses, the old Astor fur trading post, the Indian Mission House, now an inn, and the sleeping fort, deserted by its military occupants in 1894; but to those who remember Mackinac when yet virgin soil, free of those concretions of living which, in vulgar curiosity shops and pretentious frame houses, seem, to a judicious mind, equally detestable, its present condition may only raise pangs of disappointment.

There is humor, however, to be gathered

MACKINAC, ISLAND OF MACKINAC

from an inspection of the many stores devoted to deepening the tourist's associations by increasing the weight of his hand bags. Besides Indian work in beads and baskets, moccasins, pincushions, birch toys and rustic picture frames, you are invited to form purely *local* impressions of Mackinac by the offer of tiger-eye stone from South Africa, abalone shells from California, or corals from Bermuda. Perhaps the most valuable purchase you can make at these booths is Miss Constance Fennimore Woolson's "Annie," the story whose opening chapters have so prettily enclosed the physical features and early life of Mackinac. The camera can, indeed, secure things not otherwise purchasable, the many aspects of the Fort, its whiteness and long contour abounding in nooks, recesses, and close studies.

The island of Mackinac contains two thousand two hundred and twenty-one acres; it is rudely triangular in shape, and on its west and east shores, fronts the waters of the lake with vertical cliffs nearly two hundred feet in height. These bluffs decline towards the northern shores, and at British Landing you walk out of the woods upon the spectral beach, strown with white limestone pebbles The view is very pretty here, but the camera fails to catch its effects of distance over the water. It seldom does.

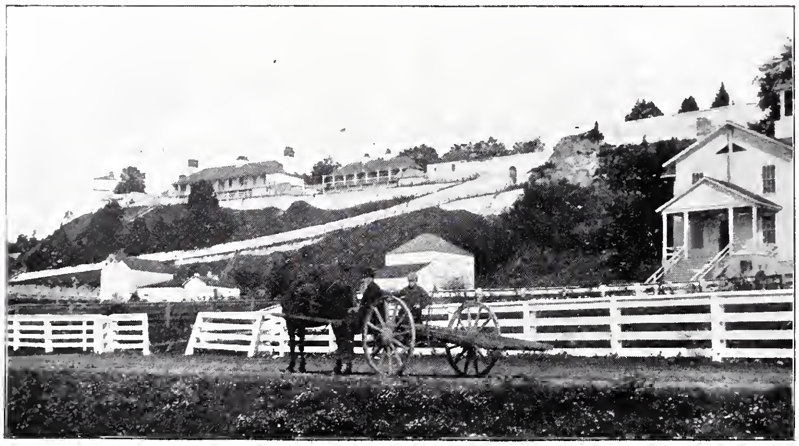
The island rock is Upper Helderberg Limestone, and the weathering and erosion of this soluble rock has been the origin of many of those natural features which the cabmen and guides invest with legendary interest, or explain by impossible and very bold scientific fabrications. Amongst these the most surprising is the "Sugar Loaf," a colossal butte of limestone rising abruptly from the plain of the woodland, looking from its contorted and irregular structure like scoria. Bushes have inserted themselves over the inclined sides, and the whole lump resembles the ruined *teocallis* in Mexico, or the queer temples at Uxmal. It is a residual and refractory nucleus of limestone, which has resisted the destructive agencies which have removed from all sides of it the country rock. It is pierced on one side by a moderate cavity, which upon every square inch of its surface is covered with names, the scribbling having become so desperate as to produce nothing but undecipherable mixtures of lines. The American justly carries with him the "spirit of liberty"; he might wisely drop his zeal for personal advertisement. The photograph of this is a most obvious appeal to the "dry-plater," and scarcely a camera passes it which from one point or another does not "take its measure."

Another example of erosion much more graceful and alluring is the "Natural Arch," through whose span, as a frame, you see the dimpled surface of Lake Huron. There is some room for taste in photographing this, and the prettiest results give the arch diminished, with a boat or sail on the water far below.

The visitor will particularly rejoice in the woods, so open fresh and winning; the roads wind through their undisturbed depths, and squirrels, highholders, jays and woodpeckers, scamper and fly through the half-lit gloom. Again here let the amateur learn a lesson in "exposure." Ten to one he will be deceived by the light sifting through this leafy screen, and find his plate all black or white. But then exposures are after all not only a matter of light but of plates *vs.* developers. We are all familiar with our old friend "Carbutt B," and our later acquaintance, "Cramer, anchor, banner or crown," and we know in the matter of exposure they have very opposite failings. And then as to developers, why, my friend Mr. L. C. Laudy will put me up a developer that somehow or other will draw a picture out of a plate almost guiltless of ever having met sunlight at all. It beats the Dutch how he does it, but he does, and if I am unfortunate enough to survive him, the most enduring memento he can leave me is the recipe of that developer.

On Mackinac the Arbor Vitæ is most beautiful, broad trees hewed out in green, and reposing against the yellow bank below the fort, or sitting in bewitching contrast against the white walls of the army quarters.

The island of Mackinac links the present with a far distant past Here the first French pioneers and missionaries met the Algonquin Indians or the Hurons, and engaged them in the collection of furs, a pursuit that afterwards, under encouragement of Mr. Astor, assumed important proportions. John Nicolet passed the island about 1634 on his way to Green Bay, Wisconsin, Nicolas Perrot passed it in 1665 on the same errand. Father Claude Allouez visited Mackinac in 1669, and, we are told, gathered here the legendery story of Hiawatha, who, according to Algonquin traditions, was born on Mackinac. Marquette carried on his missionary labors upon the adjoining mainland at St. Ignace, and doubtless visited the island. St. Ignace became an emporium of the fur trade, a stopping point for traders pressing westward, and a center of missionary enterprise.



FORT MACKINAC, ISLAND OF MACKINAC

The island of Mackinac was involved in its activity, and amongst the retinue of its early visitors are the distinguished names of La Salle, Louis Hennepin, and Henry de Tonty. This Mackinac region lay on the thoroughfare of the great lakes, and past its frowning precipices the bold *coureurs de bois* and their Indian allies or foes pushed the canoes that sank to the gunwales with their loads of peaceful traffic, or reinforcements of war. Its history is a varied narrative of frontier exploits, and the endless prolixity of Indian alliances and feuds. This island, covered to its verge with wood and bathed by so many currents, has been the scene of every form of episode incident to those early and rugged days, and revives romantic memories.

Fort Michilimackinac was not on the island of Mackinac, but upon the opposite shores of the Upper Peninsula of Michigan, and unsupported except by the distant stations of the Sault Ste. Marie and Green Bay.

In 1780 the present Fort Mackinac was built on the island, and in 1783 it was nominally ceded to the United States, though it was not until October, 1796, that two companies of United States troops arrived and took possession of the post. The English regained control of the fort in July, 1812, having invaded the island with a force made up of regular troops and Indians to the number of over nine hundred, and with two pieces of artillery. Against these overwhelming odds the Americans could muster but fifty-seven; surrender was inevitable.

The most fascinating suggestions, in connection with the island of Mackinac, spring perhaps from its identification with the great fur companies who were established here, and received here in their warehouses the precious booty of rich peltries secured by their trading posts far to the north. Mr. Astor bought out the association of British merchants known as the Mackinac Company, and it was at Mackinac Island that in the month of July, 1810, Mr. Wilson Price Hunt arrived to make preparations for that enterprising struggle to reach the mouth of the Columbia River, overland, which Irving has painted with such sympathy and interest. As to-day the tourist, camera in hand, looks down from the postern gate of the fort on the curving shore, lapped by the rippled water, traversed by cabs, and dotted with nursemaids, Irving's picture of a very different tenantry might be recalled, when Indian braves swaggered up and down its pebble or sand strown margin. What a chance, then, for kodaks!

The camera will find much to do at Macki-

WOODLAND VOWS BY NICOLAI

WOODLAND VOWS.

Nature, oh how grand!
Hast thou again awakened,
Never tiring in thy calling,
Life, hope and love creating—
One dependent on the other.
And in our madly rushing
First encouraged, then despairing,
Do not see the right from wrong.
Many vows the heart has whispered,
Underneath the mighty dome
Of Nature's glorious chapel,
Were the impulse of the moment,
And forgotten, when the day
Had been waning into night—
Nothing new, the old, forever,
Life and love, hope and despair?

E. Nicolai.

nac, not indeed that it offers as varied chances to the album-makers as many larger islands, but, if united with trips to the mainland, Ste. Ignace, or the quiet channels of the Sault Ste. Marie above Detour, it will repay in pictures the visit it invokes for many other reasons—as its associations and its life-renewing atmosphere.

CATCHING CLOUDS.

BY OSBORNE I. YELLOTT.

I WAS very much interested in the article on "Faking and Control," by A. Horsley Hinton, in the February *Photographic Times*, especially after having made two or three hundred negatives I had only one which showed any trace of clouds, or in any wise the existence of atmosphere. That one was an accident, and how the clouds got there I am still at a loss to say.

After reading the article in question my one desire in life came to be to catch some clouds and make some pictures just like Mr. Hinton's. Having been an amateur for only a few months I had achieved fair success in catching people, and could usually get them on the plate. Some few of my friends occasionally suffered decapitation, or the loss of a leg or arm, but they knew I meant well, and always confined their attention to the excellence of what was left. On one occasion my camera and I had been given a position of honor at a jumping contest, and I took a dozen pictures of the horses as they gracefully cleared the hurdles. I didn't develop them for a few days, and in the meantime had collected a few landscape plates. As the first plate began to come out in the developer my heart leapt with joy. I had clouds at last. It was not until I saw the people standing around the hurdles, and recognized them as being the people who were at the jumping contest and not the ones in my landscapes, that I discovered my mistake. Some friends and fellow amateurs afterwards picked up the plates and took them for comets. They didn't look at all like comets, but really bore a close resemblance to the dark thunder clouds which come up on a summer afternoon. I subsequently printed them in some landscapes according to directions, and they did fairly well. My wife, who is always candid in her criticisms of my pictures, thought they were peculiar looking clouds, but with the sympathetic public generally they passed. Still they were not like Mr. Hinton's clouds, and I thought I could do better.

The question was, how? As the old receipt-books used to say in telling ambitious housekeepers how to make a rabbit-stew, "first catch the rabbit." I hadn't a doubt of my ability to print a picture with clouds in it if I could first catch the clouds. I don't know how many dollars I spent in photographic literature trying to find out how to catch clouds. Lots of the books told you what to do with them after you had them, but not one told you how to catch them. Now it is possible that every other amateur in this broad land had an instinctive knowledge of how to catch clouds when *those* books were written, but I hadn't, and I wanted to know. Business was thrown aside; I wouldn't even go to my meals; when I wasn't reading a book on photography, I was going after a new one. Meanwhile the heavens were full of the very finest clouds I ever saw, but I thought there was no good wasting plates and developer trying to get them, as I never had gotten them before, and my plates ranged from the most hopeless under exposures to the most hopeless over-exposures. My idea was to find out how to catch them from some one who knew.

ANTICIPATION JOHN H. TARBELL

From Photogram of '97.

THE CREST OF THE HILL BY C. F. INSTON

The local amateurs knew nothing whatever about clouds, although they said they knew all about them, and didn't want to waste their valuable time catching them. Some of them who were especially proud of their work said there never happened to be any clouds in the heavens when they took their best landscapes or they would have had them. They said they were easy enough to get, but it always depended upon the plate or the lens or something else, and my camera was so different from theirs that they really couldn't explain it. Then I went to my dealer. I thought surely he could tell me, as he seemed to be a past-master in photography. He said that it depended on the plates. I said, "Well, with my plates,—any plates,—sell me some plates."

"Well," he replied, "it depends upon the clouds."

"Well, any clouds, there go some now. How can I catch those?" I said, pointing heavenward, where some light fleecy ones were scooting along at the rate of thirty miles an hour in a bright blue sky.

"Well," said he, looking at them critically, "I would give those clouds one minute with the small stop."

When I got home I tried them. Up the camera went, pointed at the zenith, and out came my watch. I sighted on one and pressed the bulb, watch in hand. The sixtieth second was a long time coming, and when I closed the shutter and thought that the cloud had been securely caught, there it was floating off on the northern horizon hovering over Andree. I thought of my jumping contest, and didn't believe I could get a very clearly defined cloud from that attempt, but developed the plate anyway. It came out very promptly, in fact there was no stopping it. I have never been able to print it myself, at least so as to find the clouds, and the first chance I get am going to take it to my dealer to get him to print it for me.

Finally I got hold of a book which succinctly stated that clouds could only be caught by experience, no rule would hold.

So then my experience started. I made a diagram of the thing and worked it all out. I started in with five dozen plates, giving a dozen of them a dozen different exposures ranging from one hundredth of a second to three minutes, Maximilian Toch having said in the *Times Almanac* for 1898 that he gave his picture, "The Lone Sentinel," three minutes, and it had clouds in it. Still I had no clouds. Then I varied the stops with a uniform exposure, still no clouds. Then I varied the stops and exposures both, going it at random as long as my plates held out. I would have carried out the combination of all possible stops and all possible exposures to its end, but I saw that it would take three hundred dollars worth of plates to do it, and I hadn't that much money to put in clouds at that time.

Then I pored over Mr. Toch's article again and discovered that for black and white pictures he used a weak developer, and that his cloud picture was considered a black and white picture. I am always quick to put two and two together, and on the strength of that information, I concluded that the developer might have something to do with it. Then I started the whole thing over, laying in a few dozen more plates, and taking his exposure of three minutes and a very weak developer to start with. In the course of time I got some clouds. But I had started at the wrong end, as I found that clouds in my latitude came with a hundredth of a second exposure, the last on my list. With my experience I was able to get not less than a dozen skyfuls of clouds which I have printed in some pictures with fair success, and shall continue to print in all my pictures except a few interiors.

A few days ago I went out and took four exposures at the clouds and got four good plates, that is so far as clouds are concerned. For the benefit of the very few of my brother amateurs who do not know how to catch clouds, I will tell them, not how to catch clouds, but how I caught them. I used a well known brand of plate, such as I use for all my work, a rapid plate, but not the most rapid made, and an ordinary everyday lens such as nine out of ten 4 x 5 cameras have when they come from the store. For No. 1, I gave 1-100 second; No. 2, ½-second; No. 3, 1-5 second, all with the large stop, number eight, whether it's the American eight or the English eight or the "*f*" eight, I don't know, and have never been able to find out, although I've wanted to know ever since I ran across the table of comparative exposures in the *Times Almanac.* For No. 4, the picture with the trees in it and the setting sun, I gave one second with the small stop, No. 64. The time was from 5.30 to 6 o'clock in the middle of March, No. 4 being taken last I developed these plates with a pyro-soda developer, taking one ounce to three ounces of water, to which I added some bromide, having tackled No. 2 first, and it being badly over-exposed. After the clouds were clearly defined, I strengthened the developer by adding gradually the remaining three ounces which I had made up to start with.

And that is the result of all my trouble and about a gross of plates wasted on clouds. It can be expressed in three lines. (For me) to catch clouds make a very short exposure and develop with a diluted developer, gradually strengthening it by the addition of fresh. If some one had said that before I should have saved myself all the anguish which I have gone through to find it out. I don't say that is the only way to catch clouds or the way to catch all clouds, and I don't say that anybody else can catch clouds that way, but that's the way I caught clouds, and that's the way I'm going to keep on catching clouds until I find out a better.

This article is not written for instruction in catching clouds anyway. It is written merely to show advanced amateurs who write books and magazine articles on photography, that there are a few of us who do not know much about photography, and are willing to take pains to learn, provided we have a hint to start with. If Mr. Toch hadn't casually mentioned diluted developer, I should still have been working out that combination of all possible stops and all possible exposures, as I was firmly convinced that it was all a matter of exposure. A hint may not be all that we need, but it is something.

In this connection I would say that I like the practice of the English "Year Book of Photography" which in a number of instances tells the time of exposure of pictures which are reproduced. Were that and other useful information appended to every picture in the *Times* and *Times Almanac*, we could all become photographers in a fraction of the time that it takes ordinarily. The time of the exposure alone would be something, but add to that the plate used, diaphragm, lens, developer and other information, and the pictures would then be good for something more than merely to look at; each one would be in itself a practical lesson in photography.

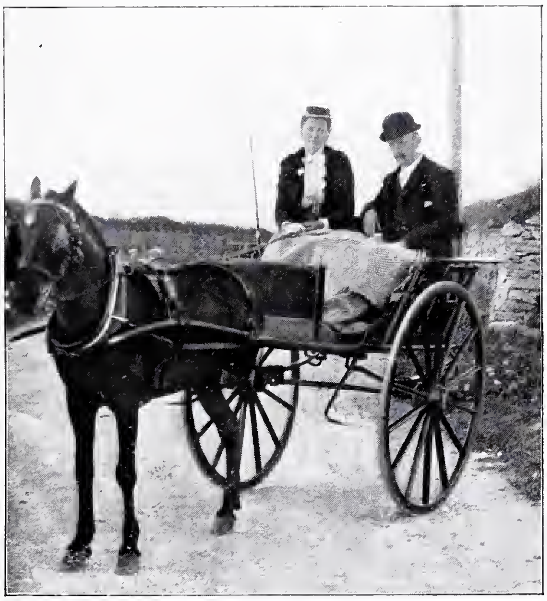
"SHUT IN" ARCADIA MO.

THE OCCULT IN PHOTOGRAPHY.

BY R. D. O. SMITH.

Now and then the photographer finds his work spoiled by what appears to be a double exposure, and which he dismisses as a bit of ill luck, or carelessness, as the case may be. How often this occurs I have no means of knowing, because the instances are seldom recorded, but I believe they happen oftener than one would suppose, and one of the purposes of this communication is to invite attention to what appears to me to be a very curious and mysterious phenomenon which is worthy of investigation, and which may possibly lead some bright mind to an important discovery.

In the Photographic Times for May, 1898, p. 226, is a picture of a three-legged horse attached to a two-wheeled road cart in which two people are sitting.



A PHOTOGRAPHIC PUZZLE BY GEO. C. NEEVES

It is entitled "a photographic puzzle," and below is a statement: "An exposure of three seconds was given and the horse was not observed to move while being photographed, yet in the picture the near hind leg is entirely missing." This is not entirely accurate, since the near hind leg is present some distance below the knee joint. I ask the readers of this to examine the picture referred to.

When we examine a phenomenon for cause, we sometimes arrive at a conclusion by a process of exclusion, and at least, in that way narrow the field for experimental examination. In this case the first suggestion is, motion on the part of the horse, though unobserved. There is also a suggestion in the text accompanying the picture, that motion does not quite explain because the editor asks, "Can any of our readers explain this curious result."

I do not propose to attempt any explanation but only to invite investigation.

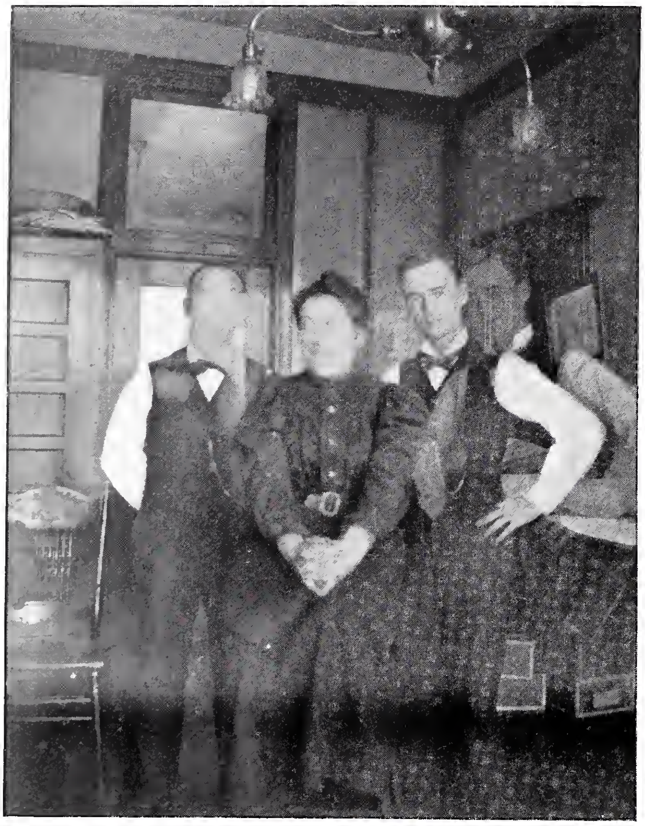
If the absence of the near hind leg is due to motion it is proper to examine what that motion must have been.

The exposure lasted three seconds, and it is therefore certain the missing part of the leg must have been removed from sight during a period of three seconds. There are only two ways known in which this could have been done, 1, by concealment behind some opaque object, 2, by motion of such rapidity that the passage of light would be apparently uninterrupted. The first is inadmissible because there is not an object behind which the leg could be concealed. 2, The only motion possible would be a vibratory one, since one end of the horse's leg is unmistakably fixed. If any mind is satisfied that the horse standing entirely without motion in every other part of him, even to the perfect quiet of the harness straps over the missing leg, could still swing that leg on a point mid-way between the knee and hock joints, or even on the knee joint, during a period of three seconds, with such rapidity as to elude the eye of the camera, then that mind has no need to look further. To my mind it involves a physical impossibility, and must be dismissed. While there are many things in the behavior of light which we do not understand, there are some things in mechanics which we may be perfectly sure about.

If the above were an isolated instance it still would have been sufficient to warrant investigation. But it is not isolated. At least one similar freak has happened in my own personal experience, and doubtless photographers can recall many of them.

I now present an occult instance somewhat different in character, though perhaps due to the same cause.

A friend of mine, a mechanical engineer, employed by Dodge Manufacturing Company in grain elevator work, had been making a number of photographs of his work in Buffalo, and wound up with a shot at his friends in the contractor's office. It was not developed until some days after, and then exhibited this freak.



Everybody says it was a double exposure, but I desire to call attention to a few reasons for dismissing that explanation.

The central figure is a young lady ; at each side close to and partly behind her, stands a young man without his coat.

Examining the young man at the lady's left he stands with his left hand on his hip, and his right arm hidden behind the young lady, and at *his* left, distant about twelve inches, stands his double. The right arm of the double is visible on the black vest of the principal and apparently *through the young lady's sleeve.*

The young man at the lady's right stands in front of the illuminated glass panel of an office door. Nearly all of his face below his eyebrows is obliterated by the light of the glass panel, the upper margin of which cuts across the head at the eyebrows, and one side of the same is projected downward across his shoulder, cutting a sharp line across his black vest and obliterating a wedge-shaped portion of the vest and half the dark neck-tie. There are also two halo patches of light on the vest. The lower edge of this glass panel does not appear across the clothing of the figure.

To say that this resulted from a double exposure is easy, but let us see what that explanation involves. The length of exposure was less than one second.

First, that the figure on the left should move about twelve inches to the right without the slightest change of attitude or expression ; and second, that *simultaneously* the figure on the right should have moved to position from somewhere outside the field ; third, that those movements should have taken place without the knowledge of my friend, for I have this positive assurance that there was no double exposure and no movement during exposure.

If it rested on that assertion alone it might be open to discussion, whether he may not have been mistaken ; but to my mind the high improbability that a double movement could have taken place in about one second of time is nearly removed to the region of infinity by the well nigh impossibility that such movement could take place on the part of the man at the left without a perceptible change of attitude, and by the almost certainty that if the figure of the glass panel had fallen on the plate before the man on the right moved to position, its whole margin would have been visible, and all the dark parts of his figure would have been obscured by its halo.

The right arm of the double is to all appearance *in front* of the young lady's sleeve, which, if due to double exposure, complicates the movement of the young man at her left.

There are still other queer appearances which look like antics of the light, which, while they serve to accentuate the occult character of the picture, are not enough of themselves to base an inquiry on.

From the considerations which I have briefly alluded to above, I set it down as certain that this picture was not a result of changed position and double exposure. What were the causes of these double images I do not pretend even to suggest, but I commend a study of them to those who have the ability and facilities for research.

NOVEMBER MORNING BY W. P. WALKER

THE CARBON PROCESS.

BY P. C. DUCHOCHOIS.

PREFACE.

In presence of organic matters the alkaline bichromates are reduced by the action of light, and the matters deprived of certain of their physical properties. This reducing action of light on chromic acid was observed by Vauquelin who, in 1797, discovered the metal, but it was only in the beginning of 1840 that Mungo Ponton succeeded in obtaining photographic images on paper impregnated with the bichromate of potassium, which he fixed by a simple washing in water to eliminate the chromium salt not altered; hence, by this primitive process, the image was formed by the brown yellow color of the chromous chromate held on the surface of the paper. Edm. Becquerel investigated the action of chromic acid on organic matters. Robert Hunt has published a very interesting process, the Chromotype, but it was reserved to A. Poitevin to discover the most important changes occurring in certain organic compounds. He showed that gelatine, albumen, gum arabic, etc., were not only insolubilized by the agency of light in presence of the acid in question, but that they absorbed no more water, and, consequently, repelled greasy matters, and ceased swelling in water. He showed also that sugar, glucose, etc., were deprived of their hygroscopic property. It is on the changes in the physical properties of these substances in question that are based the most useful applications of photography to the decorative arts, lithography, engraving in intaglio and in relief, ceramics, etc., etc.

In 1855, Poitevin published a practical photo-process to obtain permanent images by means of a compound of gelatine, a coloring matter, and potassium bichromate: it is the *Carbon process*, so called, which will be described in this book, with all its improvement, its applications, and the processes derived from the same.

By the original process, only white and black subjects, that is, pictures in line, could be produced, but as it stands now, after the improvements devised by Laborde, Fargiez, Swan, Johnson, Artigues, any picture, whether in line or in half tone, can be printed from negatives in any suitable and permanent color.

The carbon process has always been extensively practised abroad, but by very few photographers in this country, owing, no doubt

WILLOWS AT TWILIGHT BY LEON W. SHAW

SUFFOLK MARSHES

From Photograms of '97.

BY KARL GREGER

to a patented improvement consisting of the use of rigid supports for the development in the image. This and every other patent are void since a great many years, and every one can now procure and employ the necessary materials. As a consequence, the process tends to come into more general use, not only on account of the beauty of the images, but especially on account of their permanency, for "as beautiful as the ordinary silver printed photograph unquestionably is, as it comes from the hand of the skilful printer, yet a troublesome doubt as to the duration of its beauty always more or less mingles with and mars one's admiration. There is, unfortunately, no denying the fact that silver prints are very liable to fade, and the immense number of them do fade. This constitutes the one great blot on the fame of our beautiful art." It will stimulate the photographer who cares about the duration of his works, and enable the savant who wishes to preserve records of his researches and labors, to discard for such purposes the silver printing for the carbon process. The object of this book is to vulgarize it by describing the operations in a simple, complete, and practical manner.

CHAPTER I.

SUMMARY OF THE PROCESS.

A sheet of paper coated with a mixture of gelatine and coloring matters—a tissue, as it is termed—is rendered sensitive to the action of light by immersion into a bath of potassium or of ammonium bichromate, then allowed to dry spontaneously in the dark.

The sensitive compound is insolated beneath a negative *cliché* for a certain period. As the image formed is not visible, one has recourse to a photometer to regulate the exposure time.

During the insolation, the parts acted on, that is the shadows and the half tints of the image, are rendered insoluble.

After exposing, the image is developed by dissolving in warm water the parts not acted on by light—the whites of the image.

This may be done in two ways: First, by simple transfer; second, by double transfer. The simple transfer process is exceedingly simple, but the image comes out reversed To have it in the right way, one should use a reversed negative.

The operation by simple transfer consists of immersing the print in water, and then applying it upon a sheet of white gelatinized paper, called *transfer paper*, especially prepared for this purpose. The whole is immersed in warm water; the two papers are separated and the image is thus transferred, adhering to the white paper.

The double transfer process is more complicated. It gives the image in the right way, hence an ordinary negative is employed.

The insolated tissue is, as before, immersed in water but applied on a temporary support, rigid or flexible, when, after developing, the

From Photograms of '97

SUNSHINE AND SMOKE

BY EDGAR G. LEE

image is pasted on a sheet of gelatinized paper, allowed to dry, and stripped from the temporary support.

The reader having now an *aperçu* of the process, we shall proceed to describe the operations in detail.

The tissues are found in commerce, prepared in various colors. They are sold in rolls of 2½ x 12 feet, and in cut sizes from 4 x 5 to 8 x 10 inches. A special tissue more charged in color is manufactured for transparencies.

The tissue should be kept in a dry place. Exposed to a damp atmosphere it attracts moisture, softens, sticks, and, consequently, cannot be unrolled except with difficulty; besides, the gelatine becomes mouldy and the tissue is spoiled.

In a certain period the tissue is entirely desiccated; it is brittle then and breaks easily. To unroll it, it should be for an instant exposed to the vapor of boiling water.

THE SENSITIZING.

SENSITIZING BATHS.*

1.	Bichromate of ammonium...	10 to 20 grains
	Carbonate of ammonium...	4 to 10 grains
	Water........................	1 ounce

The addition of the carbonate of ammonium has for its object to prevent the tissue to insolutize spontaneously. It should not be discarded, especially during the hot days of summer, for the action of heat combined to that of the humidity of the air rapidly causes the effect in question.

2.	Bichromate of ammonium...	10 to 25 grains
	Metavanadate of ammonium	1½ to 3 grains
	Carbonate of ammonium...	2 to 5 grains
	Water...........................	1 ounce

The salts of vanadium and those of chromium form, when reduced by light, a mordant permitting to fix certain dyes (Persoz). Hence the utility of adding the metavanadate in the sensitizing bath when the image should be toned or colored by imbibition, as we shall explain in another part of this book when describing three-color printing by the carbon process.

2.	Bicromate of ammonium....	10 to 25 grains
	Water..............................	1 ounce

When dissolved add by small quantities aqua ammonia just enough to turn the solution yellow, then add:

Salicylic acid	5 grains
Glycerine............................	5 drops

Sensitized, the tissue keeps very well.

To hasten the desiccation of the tissue it has been recommended to replace a certain quantity, say, one-third, of the water in the sensitizing bath

---

* See Danger of Handling the Salts of Chromium.

From Photograms of '97.

AN OMINOUS EVENING BY B. C. WICKINSON

by alcohol, and, to improve its keeping quality, to add crystallized phenic acid, about one grain.

If the tissue is *rapidly* rinsed on its removal from the bichromate bath, then sponged (see further on) it will keep in good condition for a longer time, but it is less sensitive.

The percentage of bicromate in the sensitizing bath has an influence on the resulting image which the reader should bear in mind: the more concentrated it is (6 per cent. is the maximum) the more sensitive is the tissue and the softer the image; the reverse occurs with a weak bath; if the negatives are flat, very weak, the strength of the bath may be as low as one per cent. Consequently the bath should be strong to print from intense, vigorous negatives, and weak to print from very soft and weak negatives in order, in the latter case, to obtain brilliant impressions.

The bath should not be used to sensitize a great many sheets of tissue, and it must be removed every three or four days, for it is soon altered by the presence of the organic matters —gelatine, sugar, etc.—which find their way into it; gelatine is soluble in a cold solution of bichromate. To work in good condition and to obtain regularity in printing, a new bath should be made when wanted for use, and each sheet of tissue sensitized by immersion during the same period. The bichromate is cheap enough.

For use the bath should be cooled to below 60 deg. Fahr.; above that temperature, if the tissue is prepared with tender gelatine, the tissue is softened sometimes enough to produce reticulation or, by partly dissolving, to originate stains on the image which cannot be remedied.

SENSITIZING.

The tissue, previously brushed to remove dust or other adhering matters, is sensitized by immersion, prepared side upwards. It curls at first; to prevent this place on each end a strip of heavy plate glass until it lies flat, when it is turned over. But before this its surface should be brushed with a wide camel's hair brush to remove air bubbles—the same should be done on the verso—for if allowed to remain there would be spots on the developed image. The reason is obvious. When the tissue shows a tendency to roll on itself, which occurs in about three minutes, it should be removed from the bath.

It must be here remarked that the time of immersion has a decisive influence on the image. The less it remains in the bath the less bichromate it absorbs and the less sensitive it is. Should it be immersed during a time insufficient, the half tints of the image might be washed off when the image is developed, and besides, clear grounds are never obtained (Monckhoven).

(*To be continued.*)

PHOTOGRAPHIC STUDIES OF SOME AMERICAN OWLS.

BY DR. R. W. SHUFELDT, C. M. Z. S.

By DR. SHUFELDT.

FEW birds give the ornithological artist more trouble to correctly draw than do the owls. Wilson, in more places than one, complained in his writings of the difficulty they gave him. He need not have mentioned the fact, for his lack of success in this direction is but too evident in his published figures of these birds. However, some of his portraits of owls are quite as good as those left us of the same species by the much over-estimated Audubon, an ornithological artist who had been so lavishly flattered prior to his death, that he had come to believe that whatever he did in this way could be nothing less than faultless. For example, all the small western owls drawn and painted by him are, in so far as their attitudes and outlines are concerned, simply impossible scarecrows; while on the other hand his Barn Owls, his Great Cinereous Owl, and his Long-eared Owl are very good. Passing again however, to his pair of Great Horned Owls, they are, without exception, the most inaccurate, ill-proportioned, *cross-eyed*, and incorrectly colored pair of these birds that have ever disfigured any illustrated work upon American ornithology at all entitled to the name. Nor does there seem to have been any excuse for this, as the species was unusually abundant in his day, and very frequently taken captive, thus affording him the opportunity to use the live bird as his model. Why both birds should have been represented as suffering from a bad case of convergent strabismus—squint— it is hard to tell; nor why both tail and legs should have been represented three times too long as compared with the size of the rest of the bird, —but space and time are far too valuable to carry the criticism further in this place.

Last autumn (1897) the present writer was loaned a number of specimens of living owls, representing several American species, by Mr. Edward S. Schmid, of Washington, D. C., and among these there was a noble example of the Great Horned Owl (*Bubo virginianus*) in most excellent plumage. This bird was photographed by me in three or four different attitudes, and one of the most successful of these is reproduced in figure 1, an anterior aspect of the bird in a very natural attitude of rest.

This picture presents the proportions, markings, and contour of this species with absolute accuracy, and is valuable upon that account. And if one will but compare it with Audubon's figure of this owl, it will at once become apparent that the criticisms made by me in a former paragraph are by no means either unjust or exaggerated.

One of the most difficult representatives of this family that we have to photograph is the American Barn Owl (*Strix pratincola*), and the operation has been tried by me over and over again, both out of doors and in, upon a fine specimen that was in Mr. Schmid's possession last year. The Barn Owl is an odd-looking bird of very curious behavior. He hates the day-light, and will do all in his power to avoid it. When disturbed this species has a way of bending himself far forward, and then in a forlorn, ominous manner swinging his head from side to side. This curious trait has stood in my way many a time, and defeated my efforts at taking his photograph. When compelled to stand out in the light for a few moments, undisturbed, this owl almost immediately assumes a very characteristic attitude, and as it is a very common pose in this species he was thus taken by me, and the reproduction of the resulting photograph is here given in figure 2.

The life history of the Barn owl is an extremely interesting one, and it is a bird that has been written about ever since the very dawn of ornithological literature. From the standpoint of economy it is a bird of the very greatest use to agriculture; thousands of destructive rodents especially the field mice, being destroyed by the species every month of the year. During the night it is wonderfully active in habit, and often from its peculiar motions a most extraordinary appearing bird.

Success has met my efforts in the photography of other owls, such as the young of the Barred Owl (*Syrnium nebulosum*) and the Long-

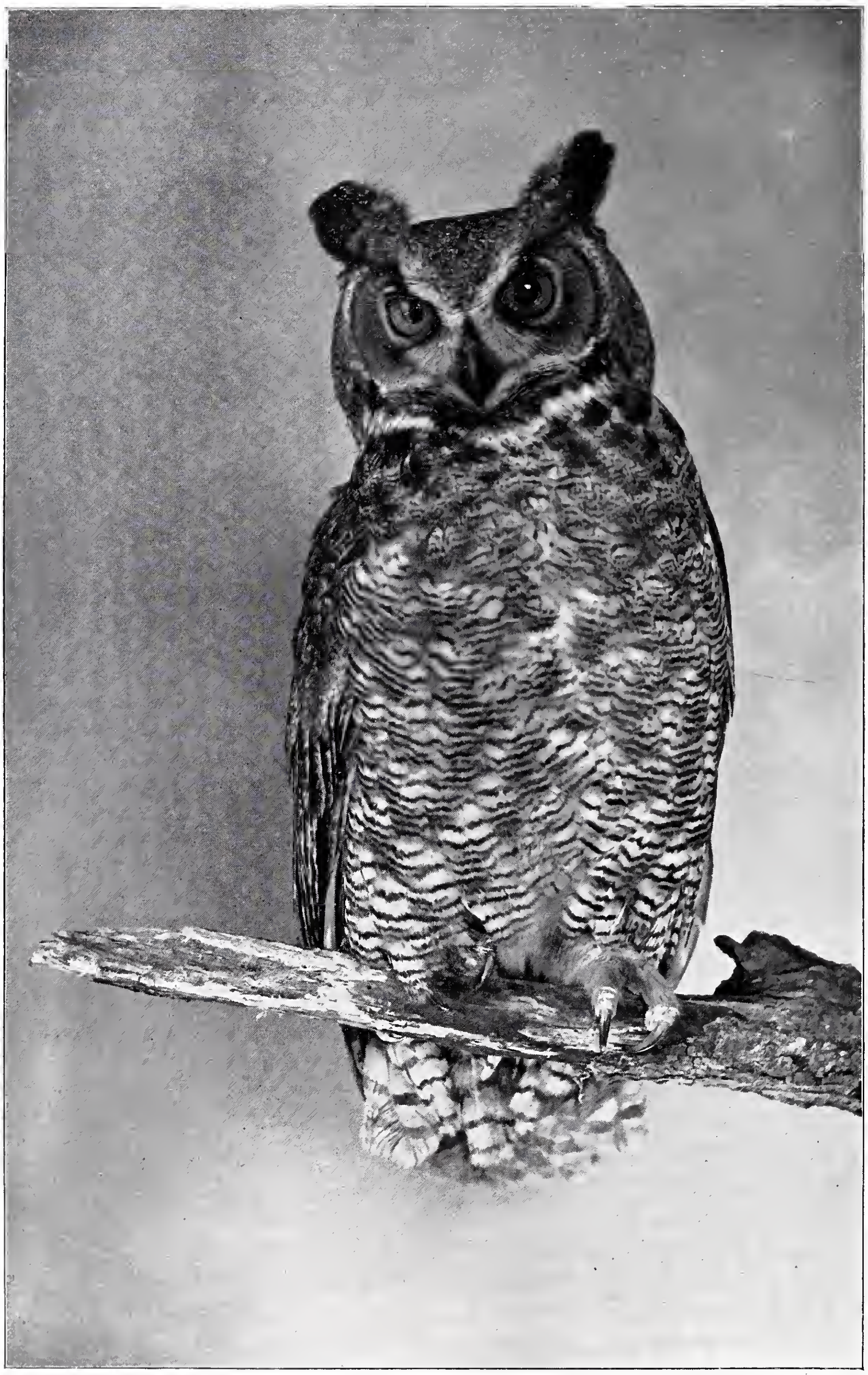


FIG. 1.—THE GREAT HORNED OWL. (*Photographed from life, and greatly reduced.*)
BY DR. R. W. SHUFELDT

eared Owl (*Asio wilsonianus*), and several pictures of these are to be found in my book "Chapters on the Natural History of the United States" (Figs. 59-62), while more recently some good results have followed my attempts with our common little Screech Owl (*Megascops asio*).

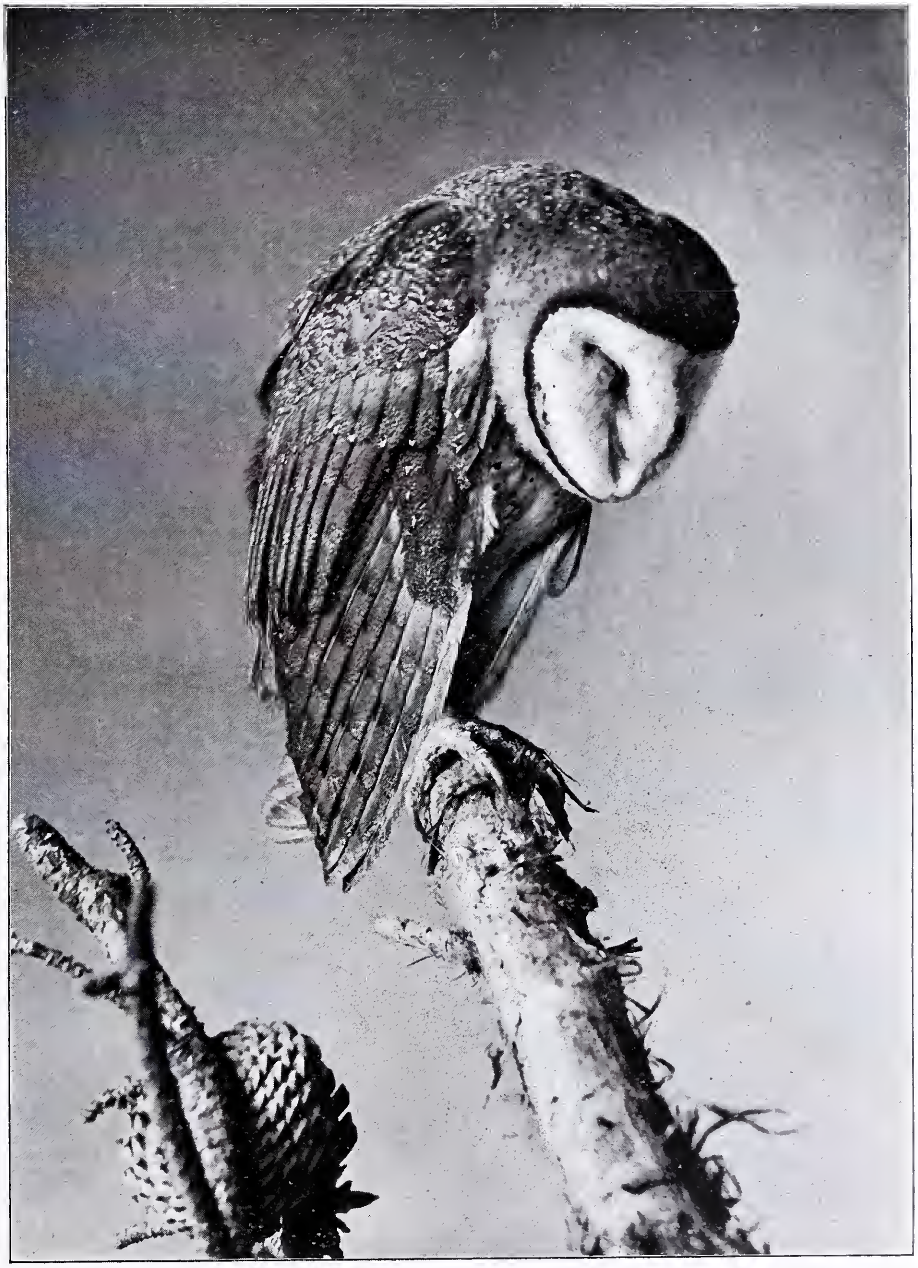


FIG 2.—AMERICAN BARN OWL. (*Photographed from life and greatly reduced.*) BY DR. R. W. SHUFELDT

This last species I have had in captivity upon numerous occasions, and have photographed both singly, as well as a pair together. Sometimes this can be done with comparatively little trouble, while again the bird will be found to be very restless and intractable. When left by itself in a moderately lit room for some time and undisturbed, the Screech Owl will come to stand very erect, elongate, as it were, its body, and erect its "plumicorns" vertically to their fullest extent. If you have left your camera ready for taking a picture in front of him, and can by the exercise of the greatest caution approach the same without alarming the subject, and make the exposure a fine picture will reward you. This I hope to accomplish some day, and indeed, have very nearly made it two or three times already. Misses do not count, however. The bird shown in fig. 3 had been

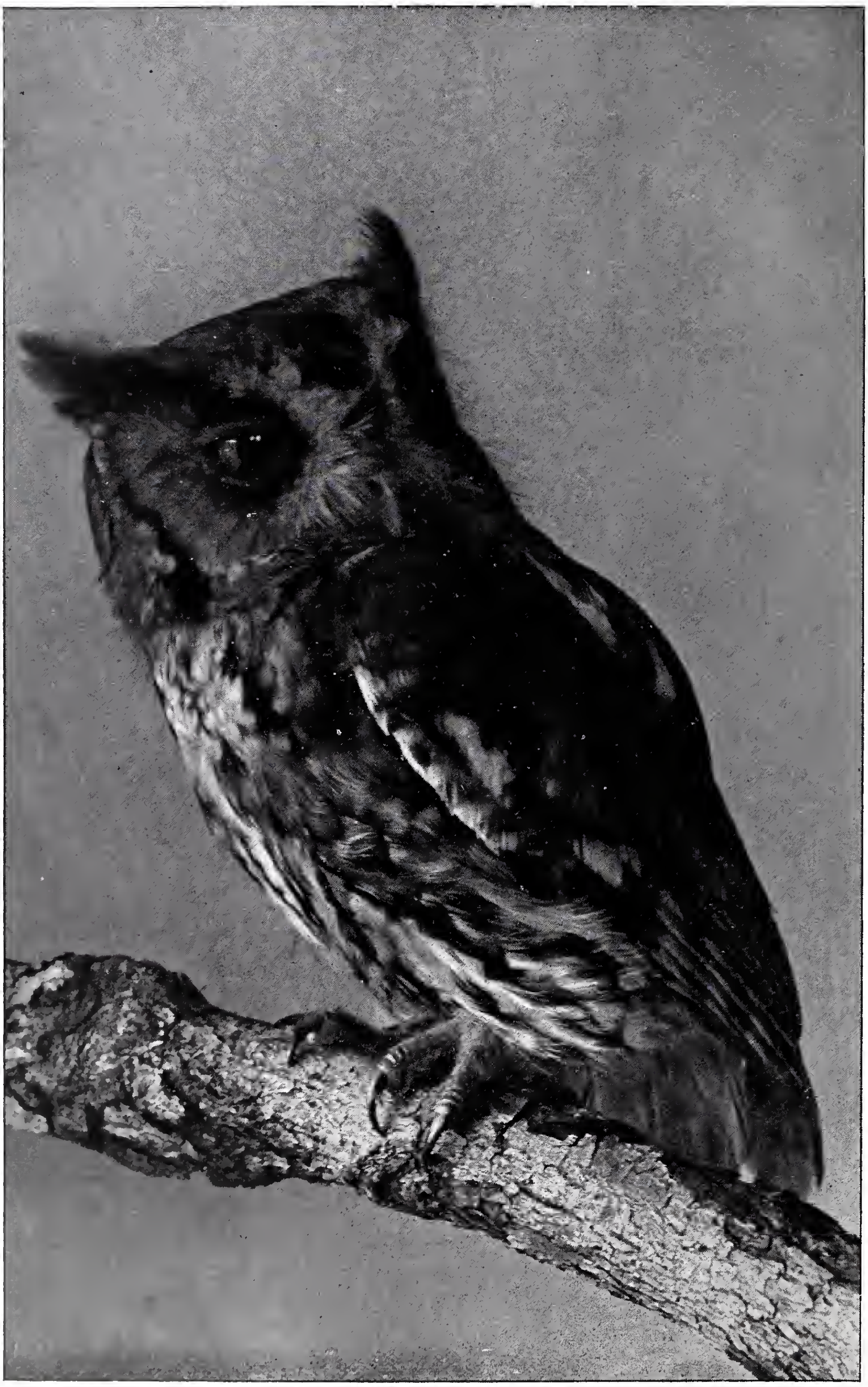


FIG 3.—SCREECH OWL. (*From a photograph from life, nearly nature size.*)
BY DR. R. W. SHUFELDT.

flying about the room for a quarter of an hour or more, when at last he chanced to light upon the limb prepared for him, on the very part of it that I had hoped for, affording me the opportunity to make the exposure. This then will explain the attitude assumed, as well as the frame of mind the bird was in. As I closed the slide and moved towards the camera, he was off again, but only to flip noiselessly about the apartment, and at last settle down in a dark corner on top of a small case hanging on the wall.

The chief difficulty to be overcome in the photography of this species is to get the specimen to erect its "feather-horns." This it is by no means always inclined to do, frequently depressing these ornamental appendages until they appear to be almost entirely absent. Often, too, the bird has a very sleepy appearance, and this can only be overcome by forcing him to fly about a bit just prior to your making the attempt to get his picture.

NATURALISTIC PHOTOGRAPHY. BY P. H. EMERSON, B.A., M.B. (CANTAB).

CHAPTER VIII.

(*Continued from Page 320.*)

It is now fifty years since Daguerre publicly announced Niepce's discoveries, and on the scientific and industrial side, photography has results to show nothing short of marvellous, but what has it to show on the artistic side? Of the thousands who have practised photography since 1839, and who are now dead, how many names stand out as having done work of any artistic value? Only three. One who was at the same time a sculptor, namely, Adam Salomon, but without first-rate artistic ability; one a trained painter, but with very second rate artistic ability, Rejlander; and one, an amateur —Mrs. Cameron. Besides these three there is no name among the numerous dead photographers worth a mention, and even now the work of Rejlander and Adam Salomon is archaic. It serves but as landmarks in the history of our art. Mrs. Cameron's work alone will survive, and only her portraits, her compositions being childish. And have matters improved? Well may it be asked by those who have the good of photography at heart, whether it will always be thus. We hope not; but if it is to be otherwise, some radical change must be made, and the blind no longer lead the blind. We have said, then, that of all the thousands of craftsmen who have practised photography and are dead, three names only stand out as having produced works to which we can apply the title artistic. Now let us see what those three have to say to the matter of retouching.*

Mr. Adam Salomon, though he strengthened certain parts of his negatives by artificial means, which in the hands of an artist like himself, was admissible, condemned retouching altogether. He says, "Eschewing retouching with brush or pencil on the film, risking the further deterioration of the negative, I make light finish the task it has, from want of time, or bad quality, insufficiently done, and in such a manner that no hand can hope to rival its delicacy and precision, and this is the only plan that a lover of his calling can justifiably pursue." So we see that a highly-trained sculptor, like Adam Salomon, said that he *dared* not retouch, but only sunned down violent contrasts at first, and then printed in all the picture, so that it could not be detected.

Rejlander, not being a painter of great ability, but having a painter's training, tried all methods in certain directions; then he came to the conclusion that retouching was inadmissible, yet he says: "I think the practice of retouching the negative a sad thing for photography. It is impossible, for even very capable artists, to rival or improve the delicate, almost mysterious gradation of the photograph. Magnify the photographic rendering of, say, the human eye, with a strong lens, and it is found to be almost starting in its marvellous truth. Magnify the retouched image, and it will look like coarse deformity. It ceases to be true. I have sometimes seen a touched photograph which looked very nice, but it possessed no interest for me; I knew it could not be trusted. I have been charged with sophisticating photographs because I combined and masked and sunned prints. But there is a great distinction between suppressing and adding; I never added. I stopped out portions of the negatives which I did not require to form my picture; I sunned down that which was obtrusive, and where one negative would not serve, I used two or more, joining them with as much truth as I could. But I never attempted to improve negatives. I never believed that I could draw better or more truly than Nature. I consider a touched photograph spoiled for every purpose." This, then, was Rejlander's verdict, and though from this we gather he had not yet thrown off the fallacy of combination-printing, yet he subsequently abjured that also. Even when he did use combination-printing, he practised it in a manner never equalled by his imitators, for like all imitators they have copied the bad qualities and left all the brains behind.

---

* Since 1882 matters have slowly improved, but until quite recently Rejlander and Salomon imitators had too much influence. That is broken now and there is hope (1890).

Mrs Cameron, the last and greatest of the three, had knowledge and feeling enough also to eschew retouching, none of her work is retouched. The more we see of Mrs. Cameron's work, and the work of Adam Salomon and Rejlander, the more astonished we are at her untaught artistic ability, for her work towers above that of both Rejlander and Adam Solomon, and were it not for her puerile figure pieces and childish angels, etc., she would have taken a very high place indeed in our world for all time, but like all untrained persons she was very uneven and uncertain, and though in her portraits, she is really great, in her illustrations to the "Idylls of the King," etc., she is puerile and amateurish.

When, it comes, by the means of retouching, to straightening noses, removing double chins, eliminating squints, fattening cheeks, and smoothing skins, we descend to an abyss of charlatanism and jugglery, which we will not stop to discuss. That such things pay and please vain and stupid people, no one denies, but so do contortionists please a certain public, so do jugglers and tight-rope dancers, and such like, but all that is merely grotesque.

There are various practices of doctoring the the negative by using paint and other mediums on the backs, or by grinding the backs of the negatives. These are, in our opinion, all unnecessary and harmful, the remarks on retouching apply equally well here. Such artifices may easily deceive and even please the uneducated, but the artist only sees them to despise and condemn them. The technique of photography is perfect, no such botchy aids are necessary, they take the place of the putty of the bad carpenter.

Of course, spotting does not come under the head of retouching. The spotter does not attempt to modify structure or tone, but merely to render an unavoidable and accidental "blemish" less patent. All spots should be filled with red paint mixed with a little gum and water, but care must be exercised in this operation, to put on only just enough paint to fill the hole.

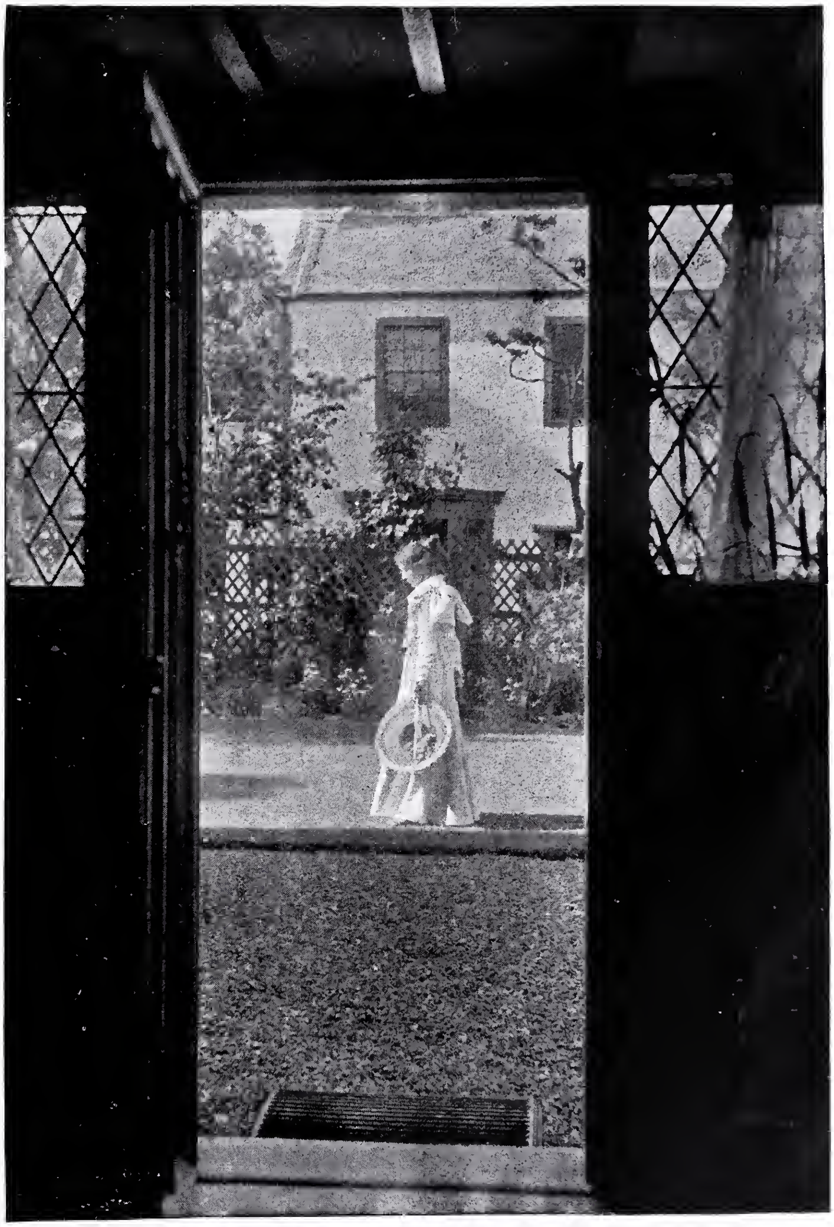
Our parting injunction, then to the photographer who would be an artist, is, avoid retouching in all its forms; it destroys texture and tone, and therefore the truth of the picture.

CHAPTER IX.

PRINTING.

Having his negative, the next thing our student will want to do is to print from it; but before doing so, it will be necessary to decide upon the process he will use.

This is a question of great moment, and one which will here be considered on purely pictorial grounds. When first we began photography, we printed in all sorts of ways; but silver printing, on account chiefly of its unpleasant glaze, was soon discarded. Then we prepared some ordinary drawing paper, and printed on that, till one day we saw an album of views printed in platinotype. Their beauty acted like a charm, and straightway we took to platinotype. Still we felt that for portraiture, a red color gave a desirable warmth. So we tried carbon, and practised it when necessary. Even now, when we look back on those days, we remember the intense pleasure carbon printing gave us In the year 1882, when we first exhibited at Pall Mall, we sent four platinotype prints, and two silver prints. At that exhibition there were only three other exhibits in platinotype. Immediately after that exhibition we determined to give up all methods of printing except platinotype, and we have since steadily by example and precept advocated that process. When we were brought into contact with artists, and learned something of art, we knew the reason of what we had instinctively felt to be true. And now, after much experience and careful examination, in many cases in company with able artists, of all the printing papers and processes to-day employed, we emphatically assert that the platinotype process is still *facile princeps*. We should maintain this, even if platinotypes were no more permanent than silver prints, but here again, as in all good things, simplicity of manipulation goes with excellency, for there is no doubt that platinotypes are permanent, they will last in good condition as long as the paper on which they are printed. This fact alone would finally place the process at the head of the list. Since the introduction of the platinotype process various papers have been introduced into the market, with unglazed surfaces, for which the quality of permanency has been claimed. Several of these are old methods



From "Photograms of '97."

IN A GARDEN FAIR
BY J. CRAIG ANNAN

re-dressed, as the gelatino-bromide and chloride papers. But are these papers permanent? At any rate they do not give any truer tonality than silver prints, and this is a fatal draw-back. We have examined hundreds of prints on gelatino-bromide and chloride paper, and they all give false tonality as compared with platinotype. The gelatino-bromide paper like all silver prints, whether matt or glazed, is false in tonality, the blacks are too black, and the whole picture lowered in tone. Then, again, as to the question of permanency, it is of course incontestable that silver prints fade, and as regards the gelatino-bromide paper, experiment has not proved it to be permanent. This is what a chemist, Mr. A. Spiller, says in the Year Book of Photography and Photographic News for 1888: Writing on "Bromide *versus* albumenized paper," he says, "From the above considerations it may fairly be conceded that *under the same conditions* a bromide print will most likely remain intact longer than an albumenized paper print; but more than this, I am afraid, with the evidence at present at hand, we are not in a position to state. In offering this, it must be understood that only under equally favorable circumstances is the bromide process likely to yield results more permanent than that on albumenized paper, for just as a gelatine plate or silver print fades when the 'hypo' fixer has been imperfectly removed, so again in the bromide process, if insufficient washing after fixing be resorted to, the resulting photograph cannot be expected to last long."

Such was the opinion of every photographer who had thought the matter out, but we give Mr. Spiller's opinion since it is that of a specialist in chemistry. In conjunction with a landscape-painter we went carefully into this question of the different printing processes, for a book we were conjointly engaged upon was to be illustrated by photographs from our negatives. We soon determined, on artistic grounds, that there was nothing that could compete with platinotype. Before deciding, however, we wrote, at the request of our publishers, to a leading producer of gelatino-bromide papers, asking him if he could guarantee the permanency of prints on this paper. When the answer came it was evasive and unaccompanied by any guarantee. These gelatino-bromide papers are to be met with under different names, and though for certain trade or industrial purposes they may be invaluable, for artistic purposes they are inferior to platinotype. Carbon, though superior to silver printing, is still inferior to platinotype, for even when the glaze is got rid of, the method of the formation of the image, being sculpturesque, gives a falsity of appearance and an unnatural running together (like melted wax) of portions of the detail.

There is, then, in our opinion, for our student, but one process in which to print, and that is the platinotype process discovered by Mr. Willis. Every photographer who has the good and advancement of photography at heart, should feel indebted to Mr. Willis for placing within his power a process by which he is able to produce permanent and beautiful work. We have no hesitation in saying that the discovery and subsequent practice of this process has had an incalculable amount of influence in raising the standard of photography. No man of taste could rest content to practice photography so long as such inartistic printing methods as the pre-platinotype processes were in vogue. If the photoetching process and the platinotype process were to become lost arts, we, for our part, should never take another photograph.

But here it is necessary to warn the student against the remarks of the platinotype company and many of their admirers, who maintain that for good prints "plucky" negatives are necessary; and then follows the old story about "fire," "snap," "sparkle," and Co. As we have already despatched that gang, we will spend no more time over them. For low-toned effects, and for gray-day landscapes, the platinotype process is unequaled, but the "fire," "snap," "sparkle" company think such effects bad, weak, muddy, and what not. Of course, the student will listen to nothing of this, but try for himself, and when he wants advice, let him ask it of good artists. We once showed a gray-day effect to a clerk at the Platinotype Company's Office, having previously had the opinion of some first-rate painters upon it; the clerk looked at it critically and said "Yes, very nice; but look at this," and he took us to a frame hanging in the same room and pointed to a commonplace view, taken with a small stop in bright sunlight—a view, we believe, of a church or something of that kind; there was *his* ideal of what a platinotype should be. The print in question was very fit for a house-agent's window. No! Platinotype printers do not seem to know what a good thing they have.

(*To be Continued*)

THE USE OF TWO STOPS DURING ONE EXPOSURE. BY G. A. T. MIDDLETON, A.R.I.B.A.

A strange thing to do this, many will think, and quite out of the question with open views and rapid plates; yet it has its use when dealing with interiors. These are usually photographed with plates of medium rapidity and by using a small stop; but this has the double disadvantage of taking up a great deal of time, and in producing a picture which is equally sharp all over, beautiful from a technical point of view, but quite lacking in atmosphere and distance. To use a sharp stop only produces just the opposite effect, and it is to hit the mean that the employment of two stops is advisable—a small stop first for, say, one-half to three-fourths the correct exposure, and then replacing this (by opening the iris diaphragm, let us say) by a large stop for just a little while. The result is that outlines are softened, a general effect of roundness being given where it is needed, and of distance also. The product is no longer a diagram—by playing with the camera, using it intelligently, something more has been got out of it than a mere mechanical record, though how much and how little depends upon the "personal equation."

Whether to use such means—an undoubted "fake"—to achieve one's end, is a matter upon which there is still disagreement. Some think the end itself to be a wrong one, though those who hold this opinion are rapidly becoming fewer; while others would rather reach it by using a medium stop throughout. This latter miss their mark, for the result is scarcely the same, though they "waste" less time than if the small stop was used entirely.

How it has happened it may be difficult to explain, but certain it is that particular laws of photographic procedure have become stereotyped, among these being the one that insists on interiors always being dealt with by the smallest stop available. As is usual where laws are laid down didactically, it is a faulty rule. At times and for certain purposes the small stop is essential; at other times, and for other purposes, even in interiors, the largest possible stop should be used, as, for instance, when photographing a pulpit or some other piece of detail, it being desired to suggest the surroundings, but not to bring them into prominence or conflict with the main object. Again, and frequently with general interior views, the two-stop method has its advantages at times. Like any other, it must be used only after consideration—for which there is ample time, as a rule, after exposure has been commenced with a small stop.

WILD BLACK RASPBERRY BY H. TROTH

Many may think that this is a small matter to make so much fuss about; and so in itself perhaps it is. But its significance is not in itself alone. Advocacy of the use of two stops, to achieve a definite purpose, is one small instance of the larger and more general advocacy of the use of any legitimate photographic method to achieve any legitimate photographic purpose. If you want a diagram, work for a diagram; if you want prettiness, work for prettiness; if you want the suggestion of nobility, of age, of youth, of the mystical, work for such suggestion. Such is the general advocacy. The use of two stops during the same exposure is one means of many which are comparatively little known and rarely used, which should be used but rarely, but which certainly should be known, an additional tool to the hand of the expert workman.—*The Amateur Photographer.*

TONING BROMIDE PRINTS. BY EDMUND A. ROBINS.

It is often felt that the cold tones produced upon bromide paper are not suitable for many of the purposes to which this useful article can be put, and many methods have been proposed whereby the cold tone can be altered to one more suitable to the subject of the picture, and it is the aim of the following notes to give a few of the easier and more permanent methods whereby warm tones can be produced. The most permanent method of toning bromide prints is that of altering the silver of which the image is composed to silver sulphide. The substance is of a warm brown or sepia tint and is quite permanent in air, and it does not yield even to such a powerful bleaching agent as chlorine. The print must be carried further in development than is usual, as toning tends to slightly reduce the intensity of the print. The print must be alumed after fixing, and is then immersed, with or without previous washing, in the following:

Hypo	9 ounces
Alum (common)	1 ounce
Water	60 ounces

The bath is heated to about 120 deg. F., before the prints are immersed, and the operation should be conducted in a current of air, or out-of-doors, as sulphur dioxide is given off and is very unpleasant. The prints tone slowly and gradually attain a sepia tone, which varies with the quality of the negative, a brilliant negative giving a richer sepia than a weak negative. After toning, the prints are washed and dried, any scum upon the surface being removed by a tuft of cotton wool and plain water or weak acid. Very fine effects can be produced with this bath upon Eastman's new "Royal" bromide paper, approaching carbon prints in quality. The next most important toning bath is uranium, and although this is generally tabooed because of its so-called non-permanent qualities, if reasonable care be taken in the manipulations no fault can be found with it in this respect. The bath that has produced excellent results in my hands is:

Potassium ferricyanide	10 grains
Water	10 ounces

Add—

Acetic acid, glacial	4 drachms
Uranium nitrate (10 per cent. solution)	2 drachms

The mixed solution will not keep more than thirty minutes. Any tone can be produced from sepia to a Bartolozzi red. The print is afterwards washed until all the yellow stain is removed, any left in reducing the permanency. Too much washing will remove all the tone, and as the process is one of intensification the prints should not be too dark. If the uranium-toned print be immersed in the following solution a sea-green tone is produced, which has a very charming effect for seascapes and moonlight scenes—

Ferric chloride	1 part
Hydrochloric acid	2 parts
Water	300 parts

Bromide prints can be toned to a Bartolozzi red by means of Schlippe's salt, or thio-antimoniate of soda. The print is first bleached by immersion in the following—

Potassium bichromate	20 grains
Hydrochloric acid	2 drachms
Water	10 ounces

It is then washed until free from all the yellow stain, and flooded with a solution of Schlippe's salt, 15 grains to 1 ounce of water; the print at once assumes a Bartolozzi red tone, and only requires washing to complete the operation; this is also an intensifying process, and so the print must be kept fairly light, and all hypo must be washed out before toning. To obtain a brilliant blue tone the following process is available, and is quite permanent: To a 10 per cent. solution of ferric chloride add a 10 per cent. solution of potassium ferricyanide until no more precipitate is formed. This precipitate is dissolved by adding a 10 per cent. solution of potassium oxalate, giving a deep green solution quite clear, and in this the prints are immersed until the required tone is obtained. If the action be too rapid it may be slowed by diluting with water. The prints are washed and cleared by flooding with a 2 per cent. solution of hydrochloric acid; this may be turned to violet by placing in a 1 per cent. solution of ammonia. Bromide prints may be altered in tone by bleaching in chlorine water and redeveloping *in daylight* with any ordinary developer.—*The Amateur Photographer* (English).

GUM-BICHROMATE PRINTS AT THE SALON.

BY ROBERT DEMACHY.

Most of the particular effects shown at the Salon by British and Continental workers in the chromated gum process have been attributed to painting in or deliberately altering lines with the aid of the brush or some other similar instrument. It is a mistake; these effects have been obtained by washing out or by repeated friction with a wide flat brush. Critics will answer that it comes to the same in the end. I am not of this opinion, for washing out or brush friction simply alters values, and does not add or modify lines, as would be the case if we painted-in objects or modified contours, a thing I have never done, and am not able to do even if I admitted the legitimacy of it, for I neither know how to drawn or to paint. I can say as much for the methods of two of my compatriots, who have often worked in my presence, and I could even vouch for others, for it is next to impossible to add new matter to a photograph of any sort without producing a difference of texture between the rest of the film and the painted-in part, so marked and so gross that the print so treated would be practically ruined.

To criticize a painting, from the art side only, there is no need for the critic to know anything of the technical methods of its author. It ought to be the same for a photograph, yet, with a few exceptions, no such thing has been done for the bichromated gum prints shown at the Salon. They have only been judged from the technical point of view.

Nothing would induce me to rush into print because a critic has found my composition bad or my values false, for, after all, perhaps he is right and I am wrong, but when we are told that the modifications in our photographs have come to such a degree that it would be simpler and more honest to discard the camera altogether and *paint*, we have the right to answer that our brushes are used just the wrong way for painting, for we remove pigment instead of applying it. We leave the results of our work to critic's artistic appreciation, but we know to a certainty, and he does but guess, how we managed to get them.

When a critic, well qualified by his position, advises successful workers in the gum-bichromate process to abandon photography and take to painting, this evidently means that to his eyes there is on a chromated gum print so little pigment that is not laid on with the brush, that it would be simpler to go half a step further and use the brush without the aid of the lens. But is it not plain to a man who

PORTRAIT STUDY BY CHAS. I. BERG

knows the working of the process, that we are as far removed from any proficiency in the technique of drawing or monochrome painting after years of bichromated gum printing as we were before? This process has taught us—or to be more exact, has forced us to study and learn—the all-important rules of relative values, so falsely rendered by photography, and little more, for, if composition, lighting, etc., are the common basis of all pictorial photography, and we are supposed to be proficient in this matter, the true rendering of values scarcely exists in average photographic work. The correction of false values is difficult in the platinotype development, impossible in silver printing, easy in the chromated gum process.

A man who has studied composition, balance of masses and light, values and their relation, can make a *picture* by the chromated gum process, but he may be perfectly incapable to paint one like it in monochrome, to draw or to etch one like it, unless he is already a very first-rate painter, draughtsman, or etcher, and in that case the freedom and facility of his craft being very superior to ours, he will never use photography unless for documentary purposes.

Of course in pictorial photography a knowledge of drawing is not necessary. Our lenses do the drawing for us, and probably much better than we could ever do it ourselves. What we want is education of the brain and eye, not of the hand. The special dexterity of hand and finger which is necessary for locally developing a gum-bichromate print has no point in common with the skill and dexterity of hand and finger in drawing or painting. A man can be proficient in the latter, and incapable of the former, and *vice versa*. What ought to be common to both is artistic vision. All this seems clear enough—then why talk in the same breath of photography and painting when their respective working technique and their final aspect also are so widely different?

On the other hand, is it not far from flattering for photography to ascribe every new artistic effect it can produce to the introduction of painting into its dominions? Photography can fight its own battle without the aid of pencil or brush. The public does not realize enough what acute pleasure perfect drawing of form can give to the eye, and photography, properly conducted, can give us this sensation. Also, thanks to the much decried gum-bichromate process, it can give us true values. So pictorial photography will not die because of its foundation of pure correct drawing, neither will the chromated gum process disappear because it brings to the aid of pictorial photography the means of rendering truly values and their relation. The very great importance of this, scarcely grasped at present by the mass of photographers and general public, will soon become recognized just as universally as is the importance of correct drawing; then falsity of values will shock the educated public as strongly as a badly proportioned figure does now.

This is the principle reason for which I have adopted and preconized bichromated gum printing. The modifications allowed by the process are really modifications of values, restraining or forcing development. Personally I have never used the brush to alter a portion of the print except on the conventional backgrounds. The originals of these are painted on canvas with rough dabs and strokes. This, is very old style, I am rather ashamed to admit it, yet, if I modify the reproduction of this old-style painted background on my print I am told that it would be more honest to paint the *whole* of the picture. *Il y a une nuance, n'est-ce pas?*

To resume the debate, I may say that bichromated gum prints are *not* mongrel productions composed by halves of pigment fixed by the light and of pigment added by the hand; that the modifications to which they are submitted more or less during development are the result of local washing or rubbing off, and that this is nothing more than aided or intensified development; that no knowledge of the technique of drawing or painting is necessary, though knowledge of relations of values, balance of light and shade, etc., is of absolute necessity (but this a question of brains; fingers and palette have nothing to do with it); and, lastly, that on the the whole the processs is completely and absolutely a photographic process. Of course, people will go on talking about imitations of copper-plate etchings, charcoal and red chalk drawings, etc., but these criticisms will only show off the short-sightedness of the gentlemen who wrote them, for identity of pigment is not sufficient to create confusion between different techniques and the idea of comparison between a gum-bichromate print in lampblack with its continuous tints, and an etching with its cross lines, dots, and strokes is simply preposterous, there is no resemblance whatever outside of the similarity of pigment.

A word before finishing on a strange method of criticism which seems to be in favor amongst a certain number of writers. It consists in comparing photographs with charcoal drawings, etchings, or even paintings of the very first masters, and in subsequently drawing from the often evident result of this comparison the conclusion that photography is no art because the photograph in question is inferior to Van Dyck's portraits or Constable's landscapes. For example, in a leading British journal the art critic says, referring to Mr. Watsek's admirable "Kibitz," "It recalls the pathetic studies in black chalk of Lhermite, but inevitably with less charm and pathos than in these rustic idylls."

What an easy and delightful way of criticizing! I can see the art critic going round the Royal Academy's exhibition and writing serenely, "Mr. So-and-so's landscape is not bad, but how inferior to Turner! The same for Mr. So-and-so's 'Portrait of a Lady,' it lacks the masterful touches of Gainsborough."

Is this just and honest criticism? Could many painters stand this ordeal to which we poor photographers are made to submit, when our means of expression are radically different from theirs? Nothing is said about our efforts or our composition, good or bad, but with one stroke of the pen photography and its future are disposed of, for our work not being equal to that of a recognized master in the art of painting or drawing, it must perforce be sterile and useless.

INSIDE A WATER-PIPE

How far from the mouth is the man with the lantern?

This would be discouraging if it was seriously written and read without a smile.—*The Amateur Photographer* (English).

A COUPLE OF SUGGESTIONS.

BY ELLERSLIE WALLACE.

SYSTEMATIC illustrating of well-known poems and plays by means of photographs selected, or, better yet, specially taken for the purpose, offers to the amateur an almost untrodden field. The idea is not a new one, but it might be considered so as regards the photographic public.

I have always thought of Coleridge's "Ancient Mariner" as well suited to the notion, sea pieces and pictures of vessels being now so plentiful. Ample scope for the exercise of good taste will be found in such work. If the "ship, quoth he," were represented by a modern ironclad like the "Brooklyn," it would hardly be poetical, and a transatlantic passenger vessel would not be much better. But if anyone wants a real antique for such work I may remind him that very numerous pictures were taken of the Spanish caravels at the World's Fair in Chicago, and no doubt they could be made available for this purpose. The mariner himself could be dressed in suitable manner and posed under the skylight as usual. A stuffed bird or even a large game bird of almost any kind could be hung about his neck to serve as the "albatross" and a striking effect might be made for the line where the "dead men stood together." The "going to kirk in goodly company" would be not impossible as well as the "bride red as a rose." I just mention these few places as being those that would to my mind offer good opportunities for photographic treatment—doubtless those blessed with poetical tastes would find others as good or better. Any large bookseller would supply the text bound up with as many blank leaves as were required on which to mount the pictures. I have seen illustrations for Dickens' "Curiosity Shop" where the operator had taken his models for Nell and her grandfather right out into the streets and country lanes, thus photographing them with natural surroundings, and very effective they were! I believe that endless pleasure could be had out of this kind of work.

A few days ago in a talk with my friend Mr. J. C. Browne, who has been identified with photography in Philadelphia since the earliest days of the art, he spoke of an improvement in developing plates which was at once practical and ingenious. It is well known that great good can be effected by methods of "local development," as the phrase goes. A dark spot of shadow that refuses to show any detail before the lights are in danger of being overdone is a vexation to the operator; so are dark foregrounds that hang back while a fine sky full of clouds above is growing too dense and losing detail every instant. Mr. Browne's plan of getting over the trouble is to continue the development, after starting as usual, by putting a portion of developer in an ordinary *atomizer* and directing the spray on to the undertimed parts of the plate. A most ingenious idea! Not so much because of the ease with which the fluid can be accurately directed to any part of the film, as from the fact that a full portion of atmospheric air mixed with the developer is thus applied just where it is wanted, *i.e.*, to the undertimed portions. How much better this, than pouring off repeatedly, and blowing from the mouth on the slow parts, but I have also seen this done. The new plan is more efficient, quick, clean, and convenient. The oxygen in the air is a great help to development.

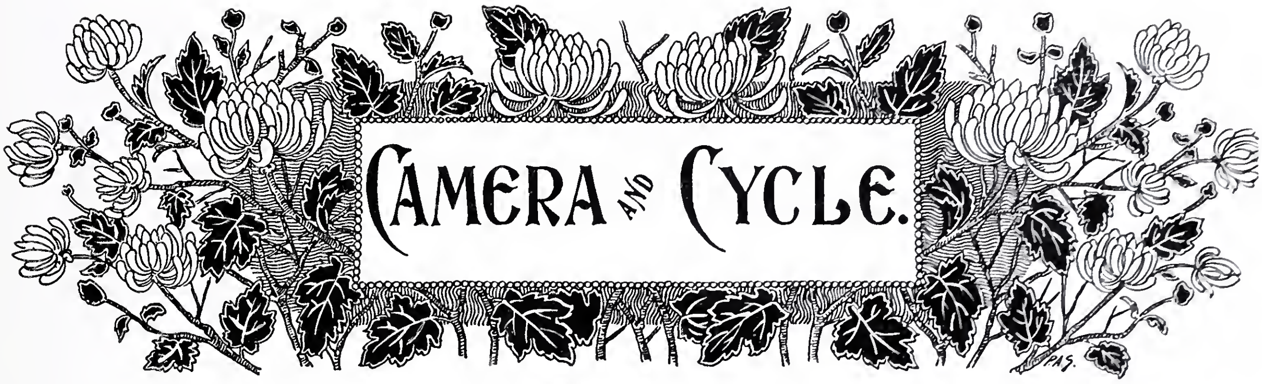
CHILD STUDY BY G. APPLETON

The Sweet Potato Field.

COPYRIGHT, 1898, RUD. EICKEMEYER, JR.

Printed and Developed by Full Gas-Light.

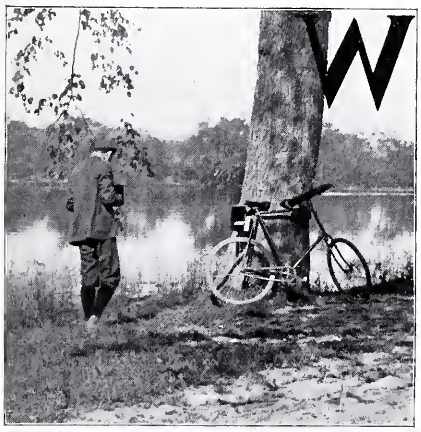
On "SPECIAL ROUGH" VELOX.



CAMERA AND CYCLE.

BICYCLE AND CAMERA.

BY FRANCIS BARKLIE.



WITH the increase in popularity with which both the pursuits of cycling and photography are meeting in these days it is a matter of the greatest satisfaction to those interested in both subjects, to view the now practicable possibilities in the combination of two such natural companions.

To the photographer, or to the bicyclist, it is hardly necessary to point out the superior advantages from a photographic standpoint, which this mode of transportation possesses over walking or even driving; nor is it necessary to enumerate the endless opportunities offered during a cycling trip for the services of a camera. It only remains to show how easily the latter may be made a part of the outfit, with the most satisfactory pictures as the result.

The first consideration which presents itself is the choice of a camera. There are, however, many makes designed especially for carriage upon the bicycle, and even those not constructed with this in view may readily be adapted to the purpose. The advent of roll films, which may be inserted in daylight has done much to popularize the cameras for which they are furnished; while, on the other hand, it only requires a dark closet or wardrobe in which the ordinary plate or roll holders may be equally well refilled.

The chief point—as, indeed, in all branches of photography—is that the lens be good, rapid, and fitted with an efficient shutter. The camera should be capable of the usual adjustments with as much simplicity as possible, and, if used with plate-holders, the device for receiving the latter should be equal to holding it securely in place and safe from the encroachments of light.

The finder, too, is a most important factor, and should be well represented. For instantaneous work a finder of good size and brilliancy will be found indispensable.

The outfit should include a good carrying case, preferably of stout leather, to fully protect the camera from dust or untimely showers.

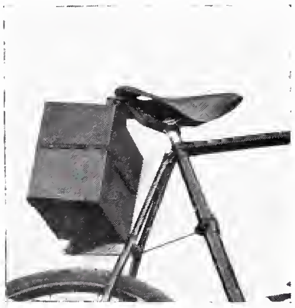
Of all the problems that present themselves in the particular branch of the subject under discussion, there is probably none more important than that of the method of attaching the camera to the bicycle.

Whether contemplating the adaptation of a camera already on hand, or in selecting one from the various devices offered by the makers, the principal objects to be attained are: security, freedom from jar, accessibility, freedom from interference with management of the bicycle, and lastly, though not of least importance—the matter of appearance. The accomplishment of all this has been found by the writer, after touring over the roads of Great Britain as well as those of our own country, to be suspension from the rear of the saddle or saddle post as shown in the illustration. In the illustration the position of the camera and the method of suspending it are clearly shown, and it may be added that any variations in size or shape of camera or bicycle may be compensated for by minor changes in position or adjustment.

The bicycle here shown was furnished with a saddle having loop-shaped terminations to its frame from which the camera—in this case a five by seven with three double plate-holders—

was suspended by means of a stout rubber band, the middle of which being secured to the seat-post by a leather strap, and the ends passing downward through the loops of the saddle frame forming elastic supports into which were hooked ordinary harness snaps secured to the top of the camera case. It will be seen that any amount of spring may be given to the suspending arrangement by letting out or taking in the leather strap. It is well here to mention the advisability of carrying an extra rubber band in case of breakage.

This arrangement, in connection with a pair of small rubber bands leading from the forward lower corners of the camera case to the end of a rigid stay fastened to the bicycle frame, maintains the camera in position, and so swung as to avoid the slightest jar. The carrying case has its opening at the end so as to permit of removal of the camera without disturbing the case.



So much for the camera. As to the tripod, which must also be provided for (although for the great field of snap-shot work it need not be carried) lightness is the main thing, though not at the expense of rigidity. The three-fold variety is exceedingly convenient, and can be rolled up in the focusing cloth and strapped to an ordinary luggage carrier on the handle-bars.

With these few arrangements, it will be seen that photography may be conveniently indulged in by the cyclist, and to any extent that he may desire, the opportunities being the same for him who makes only the exposures, reserving the subsequent labors for the professional, or for the more enthusiastic worker, who prefers to rely upon his own hands for the completion of his work.

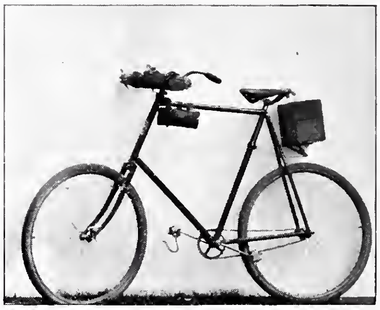
With regard to the first, there is little to be said beyond advice as to the choice and treatment of subjects, and this is a matter requiring much space, and one, furthermore, which may perhaps be best left to experience and good taste.

Probably the principal thing to be done in this connection—and this applies equally well to the more thorough worker—is to consider how the subject will appear upon the plate.

The camera, perhaps fortunately, perhaps unfortunately, does not reproduce things just as we see them ; and an object or view, beautiful to the eye, may lose much of its beauty in passing through the lens. Therefore, select and compose carefully by the finder in snap-shots, and upon the ground glass in time work.

For the tourist on a protracted trip who intends developing his own plates, two courses are open. He may either keep all his exposed plates until his return, and finish them in the fastness of his own dark-room ; or he may—though the practice is not so good—do part or all of the developing in the dark room of some professional photographer en route.

On the road the bicyclist has many chances to discover good photographic subjects, and should, therefore, not be impatient to expose his plates. A few good pictures are of much more value than a lot of uninteresting ones, and if the road does not seem to offer anything inviting, he should not hesitate to dismount and explore the lanes and by-paths in search of the picturesque. Should these explorations lead into private property, it is well to be particular in first obtaining permission of the proprietor. It is surprising how much more is gained in this way, especially in the country, where a little courtesy may open the way to some lovely view, some much prized live-stock, or, perchance, to some graceful rustic scene or group.



In conclusion, be it remembered that it is better to secure a few negatives of great excellence than many of inferior merit, and the time thus saved may be devoted to the more perfect production of the prints. Time pictures should be made whenever practicable, and great care taken to avoid, as far as possible, the vibration caused by the action of the wind against the camera and tripod during the exposure.

Editorial Notes

The forty-third Annual Exhibition of the Royal Photographic Society will be held from September 26 to November 12, 1898, in the Gallery of the Royal Society of Painters in Water Colors, 5A, Pall Mall, East, London, S. W. The Exhibition will be inaugurated on Saturday, September 24, by a private view, followed in the evening by a *Conversazione*, and will remain open daily (Sundays excepted) from Monday, September 26, until Saturday, November 12, from 10 A.M. till 5 P.M. It will also be open on Monday, Wednesday, and Saturday evenings, from 7 to 10 P.M., when lantern slides may be shown. The undermentioned gentlemen have been elected by the members of the Society to act as Judges, and have consented to serve: In the Art Section: Messrs. Harold Baker, Lieutenant-Colonel J. Gale, A. Horsley Hinton, J. B. B. Wellington, and W. L. Wyllie, A.R.A. In the Technical Section: Messrs. T. Bolas, F.I.C., F.C.S., J. Bulbeck, Chapman Jones, F.I C., F.C.S. The general regulations, which are of the usual kind, together with blank entry forms, and any further information respecting the Exhibition, can be obtained from the Secretary of the Society, 12 Hanover-square, London, W., or the editor of this magazine.

* * * * *

"It will probably have struck the reader," notes *Photography*, "that whenever a painter-artist lectures to photographers he always has a good deal to say about composition. In fact, he often insists that the majority of photographers fail as picture-makers because they fail to follow the generally acknowledged principles of composition. On the other hand there exists, undeniably, a numerically small but energetic section of well-known men who seldom neglect to seize any and every opportunity of saying that 'the less one knows about composition the better,' that 'any one can learn all that need be known about composition in half-an-hour.' Between these two parties the beginner may well be excused if he doubts which course to take. We are reminded of Disraeli's summing up of the Darwinian problem thirty years ago: 's I a man an ape or an angel? For my part I am on the side of the angels.' On the composition question we think the safer view is that of the painter—that composition is the grammar of art, and no man can safely afford to neglect it until he is quite sure that he knows it thoroughly."

* * * * *

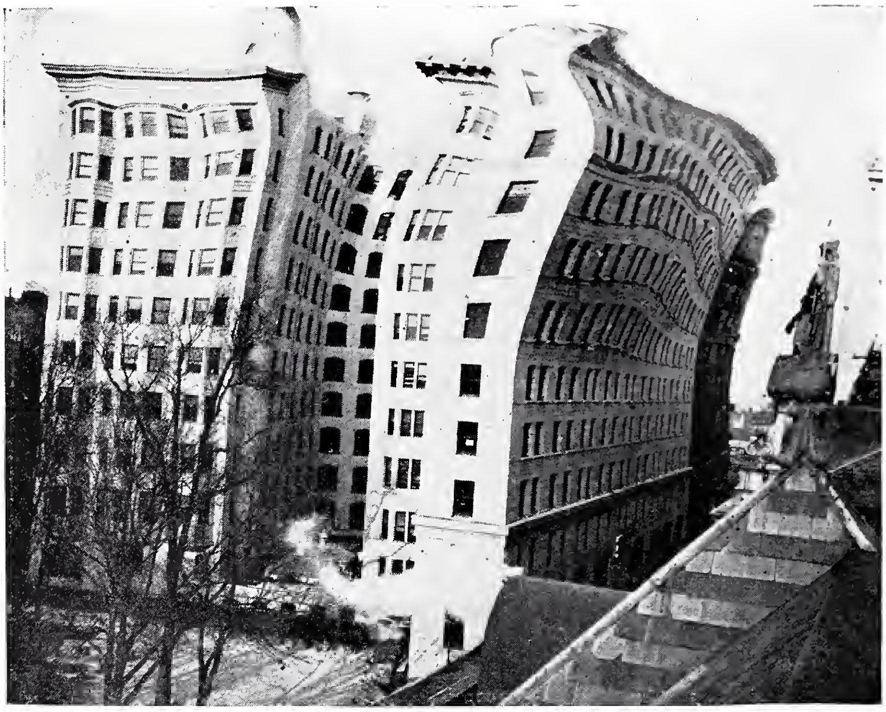
We have recently been looking through the Standard Dictionary, published by Messrs. Funk & Wagnalls. This is undoubtedly the completest dictionary of the English language that has ever been published. The definitions are remarkably well written, evidently by the ablest authorities. We must, however, make one exception, and unfortunately this is one of extreme importance to the photographer, for we allude to those words which are employed in his art.

It would be interesting, indeed, to learn the name of the gentleman who is responsible for the definition of the words employed in photography, and we trust that in future editions the glaring errors therein contained will be rectified. For instance, take the word "aristotype." The unfortunate individual endeavoring to find out its meaning learns that it is "a print made on paper treated with mixed collodion and gelatin, capable of receiving a high polish." Could anything be more absurd? The word aristotype was given by Liesegang in 1885 to a gelatino-chloride of silver paper. Since that time many firms have started the manufacture of gelatin, and also of collodio-chloride of silver printing papers, and the majority of them have made use of the same word, aristotype. But whoever heard of a mixture of collodion and gelatin; we wonder what kind of print this would yield. The fact that there are *matt* surface aristotype papers appears to be also overlooked.

The next word we refer to is "stannotype," and we learn from this authority that it is "a photograph picture taken on tin, a *tintype*—a *ferro-*

type." It is true that the word "tintype" was the vulgar term for the ferrotype, a picture made on a thin sheet of prepared iron, but no educated person would use the word *stannum*, the Latin for tin, in connection with anything made of iron.

As a matter of fact the word "stannotype" was given by Woodbury to a modification of the Woodbury process. A gelatin intaglio relief was made on glass, and this was coated over with tinfoil to protect it. The result was a printing mould similar to that used in the Woodbury process, and from which prints were made in the same manner.



A DISTORTED PHOTOGRAPH OF THE TREMONT BUILDING, BOSTON.

THE *British Journal* says: "It is not a little surprising that the method of making reversed negatives that was introduced a dozen or more years ago by Mr. Thomas Bolas is not more used than it is by those who require them for the mechanical and other processes. Mr. Banks described it at a recent meeting of the London and Provincial. The process is simplicity itself, and has the advantage of economy, inasmuch as any old, stale, or light-struck plates may be utilized for the work. All that is necessary is to immerse the plates in a weak solution of bichromate of potash, dry, and expose under the negative to be reproduced till a strong image can be seen at the back. The plate is then well washed to get rid of the bichromate, and exposed to light. It is then developed with the ordinary developer. Although the method is so simple, the results are all that can be desired; yet the process seems to be overlooked." We have often tried this method but must admit we did not find the result so satisfactory as stated by our contemporary.

* * *

THE photographic establishment of Mr. H. A. Hyatt, of St. Louis, Mo.—so well known throughout the West—is a veritable emporium of photographic goods. Anything can be procured in that establishment in the photographic line, whether in professional or amateur wants, and we understand from his advertisements that he has lately issued a bargain list of up-to-date cameras, lenses and supplies, at practically cost price. This will give a chance to both professionals and amateurs to procure some valuable adjuncts to their outfits at a very moderate outlay.

* * *

IT would be well for photographers looking for a good portrait lens at a moderate price to investigate the merits of the Suter lenses which Messrs. Allen Bros., of Detroit, Mich., advertise extensively. The advertisement appearing in the PHOTOGRAPHIC TIMES in regard to these lenses, contains a very interesting correspondence between Mr. C. M. Hayes, the well-known photographer, and Mr. R. Benecke, connected with the Cramer Dry Plate Works. That such beautiful results as those referred to, were obtained on the Cramer plate with a Suter lens speaks well for the excellent quality of the lenses, and also of the plates.

LIGHT AND THE WORK IT DOES.

BY R. CHILD BAYLEY.*

I.

When a sensitive plate is exposed in the camera, an image is impressed upon it which, as every photographer knows, can be rendered visible and permanent by the subsequent operations of developing and fixing. In a similar manner, only to a more obvious extent, when sensitized paper is exposed to light, the substance with which the paper has been treated undergoes a visible change ; its nature and properties become altered to an extent which is perceptible without the aid of the developer. This change has been affected by the action of the light, and is the product of actual work done upon the film by that light.

Before going further it is necessary to bear in mind what we mean by light. The ancients, and indeed the moderns up to quite recent years, regarded light as an actual substance. A ray of light was looked upon as a stream of particles ; a candle flame as something resembling on a minute scale a Gatling gun emitting in all directions such a stream of particles as, reaching the eye, gave rise to the sensation called vision. A parallel case in some respects is to be seen in odor. A violet or a rotten egg both give rise to odorous particles, which, reaching the sensitive tissues of the nose, give rise to the sensation known as smell. In this case we know that material particles are actually transmitted. It is easy to intercept the substances which effect the nose by a screen of some material impervious to these particles, and the "smell" itself is intercepted—we no longer perceive it. If we attempt to do the same with a ray of light we find that there are certain substances, such as glass, which, while quite impervious to all ordinary forms of matter, even to the fine particles which give rise to the sense of smell, are almost as readily penetrated by light as if nothing whatever were there. Hence we conclude light to be either a much rarer material than that of which an odor is composed, or else not to be a form of matter at all.

There is another reason for this belief, or rather another argument in support of this theory, since "beliefs" have no place in science - that is, that light can be generated and destroyed, whereas this is never the case with matter.

The "corpuscular theory," or, as it was sometimes styled, the "emission theory," which regarded rays of light as streams of particles, was very severely taxed to account for some of the known facts in connection with light. For example, to mention but one case alone, there is a very celebrated experiment of Grimaldi, elaborated by Fresnel, which we may appropriately describe at this point.

In Fig. 1 we have a lens, A B, upon which parallel rays of a monochromatic light, red for example, fall ; these rays are brought to a focus at C, and, diverging beyond, fall upon a mirror, D E F, where they undergo reflection. The mirror, D E F, is not in one plane, but consists essentially of two mirrors, D E and E F, meeting one another along the edge E, and including there a very obtuse angle, which is almost but not quite 180 deg. In other words, they are *very nearly, but not quite*, in one plane. The size of the angle is greatly exaggerated in the diagram, and is even then not too obvious. Since the angle of reflection is equal to the angle of incidence, it becomes an easy matter to construct the diagram for oneself, and this the reader is strongly urged to do, both in this and in all similar cases, for his own better understanding of the subject. We consider the case of four rays only, K L reflected from D E, and N M from E F. A screen is placed across their path at G H to intercept them.

Instead of the screen revealing an even, red coloration, as would be the case were the mirror, D E F, one even plane surface, it will be found to be crossed by a series of bands, alternately red and black. If we examine one of the black spaces on the screen, it is easily shown that it receives red light from each half of the mirror, and yet is not illuminated. Furthermore, if one mirror is covered up so that only the other is allowed to reflect light on the screen, the black space is at once lit, the bands disappearing. In other words, we find we have an experiment showing, beyond a doubt, that on adding light to light, under certain conditions, we obtain darkness ! This experiment alone is an extremely difficult one to explain on the emission theory, twist it how one will. It is manifestly an extraordinary thing, nay, an inexplicable one, that, by directing two streams of particles upon the same spot, less is received there than when one alone was allowed to act. Imagine a fireman playing with his hose upon some spot on a burning building. Another, coming by him, turns his hose upon the same place, until, when both streams meet at the point aimed at, the water disappears, and the place is perfectly dry ; remove one of the firemen and his hose, it is wet again at once.

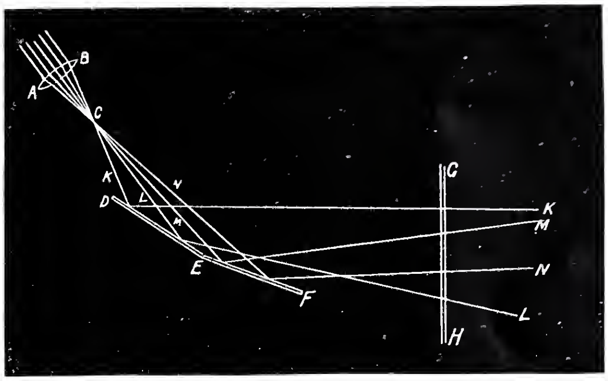


FIG. 1.

Reasoning from this and other almost if not equally unsatisfactory data (unsatisfactory as far as the emission theory is concerned), physicists gradually came to adopt, largely owing to the labors of Fresnel and Young, what is known as the "undulatory theory." This theory accounts so completely for all the facts so far as we know them, and by it experiments have been devised which in every case have given results, so clearly foreseen on the assumption of its accuracy, that it has long since passed the "hypothesis" stage, and is generally accepted as satisfactory so far as the limits of our knowledge permit.

(*To be Continued.*)

---

*The Photographic News.

PROCESS REPRODUCTION FROM AN EDITOR'S POINT OF VIEW.

BY WALLACE L. CROWDY, EDITOR OF THE ARTIST.[*]

It is clear to me that there are two ways at least of approaching the subject of my paper to-night. One is to lecture you; the other is to conciliate you.

It would be more easy than seemly that the Editor of *The Artist* should lecture you. It would not be difficult, I think, to present to you some theories concerning the phenomena of æsthetics consonant with the strange and inquisitive psychological thought of our day, which would send you home wondering what you had done to deserve this, and would provoke in your minds a feeling of silent—if not of actually hostile protest. *I* might bear your resentment for myself; but I have to think of the welfare of your courteous Secretary also. He, like the poor, is always with you. I can escape.

It is this consideration that has led me to abandon at the outset any attempt to *lecture* you. Yet I *would* ask you to bear in mind one or two facts and theories that underlie the drift of my remarks, the bed of the stream which, for all the swirling flood which obscures it, underlies every consideration of every phase of beauty; or as one writer expresses it, the transmitted recognition of utility and inutility, sexual selection, the æsthetic value of the results of primeval activities, whether seen in the everlasting hills or the tiny imprint of a leaf in the seam of coal, the mysterious ultimate principle of supersensuous, not to say supernatural origin.

I would ask you rather to bear in mind these obvious things than to listen to me while I endeavor to mislead you into the belief that I have decided as ascertained facts what are but at the best merely interesting theories.

In the present condition of æsthetic problems, then, it would be unreasonable for me to expect from you even tolerable patience should I attempt to lecture you, to ask you to follow me through the almost unthreadable labyrinth of conjecture which is bound to take the place of statement of fact—largely for the same reason that led the Irish house agent to indignantly repudiate the suggestion that there was "something wrong with the drains" of a bijou residence—

Because there were not any!

And as I have so candidly given you my reasons for not being unreasonable, you will be the more ready, I hope, to allow me to pass to the second portion of my task, and follow me in my attempt to conciliate you.

The most speedy way to do this is, I think, to make a confession. You have probably heard enough of the procedure of our police courts to know that a first offender, if he has the sense and good taste to plead guilty, is generally given the benefit of the First Offenses Act in cases of no great importance. You will, then, treat me leniently, I trust, when I throw myself upon your mercy and confess that after some years of doubt and uncertainty I have arrived at the conclusion that even if photography, by reason of the mechanical limitations which govern the act of production, cannot be ranked as an art, there is no good reason why a photographer should not be an artist.

And, gentlemen, when I say this, I do not say it in a spirit of patronage.

The time has gone by, I think, when you invite artists to come and tell you how useful photography has been to them in the making of pot-boilers. This, I hope, no longer consoles you for the many hard things that other artists have—in the dark ages—said of your black art. It would not console me to be told that my very bad lecture had helped those who are old enough to know better to make a more ambitious, because less subjective, essay.

No, gentlemen, it is no very flattering thing to be patted on the back and to be told that the work to which you are devoting your best thought and your spare vitality has got no further than the land of bondage, that artists are very much obliged to you for the odds and ends you are able to snap up, for the crumbs which you have gathered from under the artistic rich man's table. And then to be told in reply to your suggestion that you and they are, after all, rowing in the same boat—

Hem! Yes! but with what different sculls.

You must, I assure you, take up a very different position from this; you must row a very different pair of sculls from this, and show artists that *your* sculls are not merely furnished with the modicum of brains which the wielder of paint condescends to grant you.

The good photograph is better than the bad picture any day or hour. I wish I could show you on the screen what I can only imperfectly explain to you in works. But, as an illustration, let me take Moroni's "Tailor,' which shares with Greuze's "Widow," I believe the honor—or the discomfiture—of being the most frequently copied picture in our own incomparable National Gallery. Go into the National Gallery any students' day and see the copies that are made from this sartorial masterpiece, and with the melancholy impression created in your mind by these, cross the road to Hanfstaengl's and see *their* reproduction of it! You will then feel something of my meaning and will realize what is intended by me when I say that—

A good photograph is better than a bad picture.

You will leave Hanfstaengl's with a feeling of pride in the art which you practise, and even if you cannot repress a regret that these photographs are made in Germany, you will, after all, rejoice that photography can do such good work. I forbear to make mention of individual English photographers, very worthy rivals of any foreign artist, for reasons which you will fully appreciate.

The photograph cannot in its main characteristics compare with the work of Moroni; it is a product which produces an entirely differing set of æsthetic emotions, but it is in itself and judged by itself a very satisfying and beautiful thing.

You will confess, I hope, however, that powerful for good as a fine photograph is, it can seldom transcribe an idea; it must always, I fear, be concerned chiefly with things. Herein lies the great difference between photography and art.

Mr. Watts said lately to a friend: "I paint ideas, not things." The saying requires definition. Ideas, if they are not the whole of art, are the whole of Watts. They have inspired his career; they are his reason for existence. If Mr. Watts paints, it is not for his own pleasure, nor for that of others. He paints to serve his generation. He paints to teach cockneys morality, and to make cabmen consider their destinies rather than their destinations! For the proper mission of art is to urge men to higher things and thoughts, and to fulfil this mission the artist strives to incarnate in his art an echo of the vital interests of life; something that may suggest more to human nature as a whole than the purely artistic conception of his subject. "My aim is now and always will be to the end," said Mr. Watts, "not so much to paint pictures which are delightful to the eye, but which will go to the intelligence and the imagination, and kindle there what is good and noble, and which will appeal to the heart." He has been well called "the painter of eternal truths."

---

[*] Read before the Photographic Society of Great Britain.

"To produce great works," he wrote to a friend one day, "one ought to be intent upon doing one's utmost, and—

"Never stop to consider whether the thing be great or small in abstract."

As I have said, photography can seldom present an abstract idea, but the lofty aims of Mr. Watts can guide and inspire all artists, and therefore, gentlemen, I have not hesitated to dwell on his views and conceptions of art. The artist-photographer, if prevented by the restrictions of his medium from transcribing abstract mental and moral ideas, can, at all events, give us much of the sentiment and poetry to be found in Nature. But I need hardly warn you that nature should not be tampered with.

I have heard on very good authority that a certain eminent practitioner amongst the members of your profession, a gentleman who lives surrounded by some of the most beautiful natural scenery of our home countries, never travels in search of subjects for his camera unless accompanied by a lady model, *and a sunbonnet*. You may ask me, gentlemen, why I drag in the sunbonnet—and that is exactly what I would ask the eminent practitioner to whom I have referred. He would tell you perhaps that he was fond of sunbonnets. If he was very honest he might confess that they suggested peach-blossom cheeks, and eyes with unfathomable depths of unrevealed soulfulness. If he did, it would be the human man and not the photographer who was speaking; and my concern is with him as a photographer rather than as a mere man—with the superior part of him, that is.

I am not quarrelling with the man, either for traveling with his lady model or with her sunbonnet, but I *am* quarrelling with the photographer who endeavors to bring everything in Nature down to this level. In every "landscape study" by him that I have seen there is this sunbonnet. It is worn on fine days and on wet days, in midsummer and in midwinter, by the sad sea shore, and amid the mysterious murmuring of the swaying pine trees—where there is no sun. It is everywhere, and it spells ruin to his reputation. I might say with an eminent painter-etcher, who, in answer to the enthusiast who had told him there were only two great artists—Velasquez and himself—"Yes! but why drag in Velasquez? Why, indeed, drag in the sunbonnet?

In this connection you will pardon me if I ask you to listen for a few moments, not to me, but to the Sage of Brantwood.

"The moment we begin to look upon any creature as subordinate to some purpose out of itself, some of the sense of organic beauty is lost. Thus, when we are told that the leaves of a plant are occupied in decomposing carbonic acid, and preparing oxygen for us, we begin to look upon it with some such indifference as upon a gasometer. It has become a machine; some of our sense of its happiness is gone; its emanation of inherent life is no longer pure. The bending trunk, waving to and fro in the wind above the waterfall, is beautiful because it is happy, though it is perfectly useless to us. The same trunk, hewn down, and thrown across the stream, has lost its beauty. It serves as a bridge—it has become useful; and its beauty is gone, or what it retains is purely 'typical,' dependent on its lines and colors, not on its functions. Saw it into planks, and though now adapted to become permanently useful, its beauty is lost for ever, or to be regained only when decay and ruin shall have withdrawn it again from use, and left it to receive from the hand of nature the velvet moss and varied lichen, which may again suggest ideas of inherent happiness, and tint its mouldering sides with hues of life."

This, then, belongs to the range of thought that I would wish to emphasize; this is what happens when we become possessed of the spirit of the perambulating sunbonnet. You do not need the sunbonnet as an aid to art. It belongs to the Tea-tray School. If you cannot do without it, well, your æsthetic result will suffer. The sentiment of Nature is outraged by the sunbonnet, and instead of adding to the beauty of your picture by the adopting such an extraneous aid, you merely emphasize the fact that you are not representing, but are manipulating Nature. She does not need it, I assure you, and what I, in common with most art editors, frequently suffer from at the hands of the photographer is this desire on his part to arrange things nicely. In this way he gives you art *and* things; when all you ask for is Art—without the *things*. The making of pictures is a mistake, and photographers are better off than painters inasmuch as they have less to unlearn. What painters have to unlearn are the fast-clinging parasitic traditions of the early Victorian period, the simpering babies, the dogs with the false sentiment of the Punch and Judy showman, the dogs, that is, that are readily purchased by gentlemen of the Stock Exchange, who are so occupied in making fabulous fortunes out of nothing more tangible than other people's money that they have no time to think about art, and the Lowther Arcadian shepherdesses, at the sight of which the old lady from the country exclaims, "Why, that's just like my Hemma!" Painters have all these traditions of sixty and more years of Burlington House to get out of their systems. You gentlemen are members of a much younger art, and should start at the point where artists now are.

It has been said somewhere that *the ugly* was first introduced into art when the first portrait was painted. This is not even half a truth! It is difficult, I know, to make a pretty picture out of a plain sitter, but I am not sure that we want pretty pictures. For the constant attempt at prettiness rather than character I do not blame photographers only. It is no doubt largely the fault of that general public which, before it sets forth to have its photograph taken, carefully arrays itself in its stiffest and most unnatural, inhuman, and uncomfortable Sunday dress; that general public which becomes speedily idiotic when asked by the photographer to "kindly assume a pleasant expression," and I need not warn you that no one can be anything but simperingly inane when he or she endeavors to look pleased with another human creature ready to "take the cap off." Really there is no longer any need of pretty pictures, but you must strive to catch and convey the character of your sitter, and for this purpose you should strive to get hold of him in his shirt sleeves, or at least in his oldest and most becoming, because his most humanized, coat.

How deeply the false and artificial in everything moved Ruskin may be gathered from his criticism upon Claude's "Il Mulino."

"The foreground is a piece of very lovely and perfect forest scenery, with a dance of peasants by a brookside; quite enough subject to form, in the hands of a master, an impressive and complete picture. On the other side of the brook, however, we have a piece of pastoral life; a man with some bulls and goats tumbling headforemost into the water, owing to some sudden paralytic affection of all their legs. Even this group is one too many; the shepherd had no business to drive his flock so near the dancers, and the dancers will certainly frighten the cattle. But when we look farther into the picture, our feelings receive a sudden and violent shock, by the unexpected appearance, amidst things pastoral and musical, of the military; a number of Roman soldiers riding in on hobby horses, with a leader on foot apparently encouraging them to make an immediate and decisive charge on the musicians. Beyond the soldiers is a circular temple, in exceedingly bad repair; and close beside it, built against its very walls, a neat watermill in full work. By the mill flows a large river with a weir all across it. The weir has not been made for the mill (for that receives its water from the hills by a trough carried over the temple) but it is particularly ugly and monotonous in its line of fall, and the water below forms a dead-looking pond, on which some people are fishing in punts. The banks of this river resemble in contour the later geological formations around London, constituted chiefly of broken pots and oyster-shells. At an inconvenient distance from the waterside stands a city, composed of twenty-five round towers and a pyramid. Beyond the city is a handsome bridge; beyond the bridge part of the Campagna, with fragments of aqueducts; beyond the Campagna, the chain of the Alps; on the left, the cascades of Tivoli.

"This is, I believe, a fair example of what is commonly called an 'ideal' landscape; *i. e.*, a group of the artist studies from Nature, individually spoiled, selected with such opposition of character as may insure their neutralizing each other's effect, and united with sufficient unnaturalness and violence of association to insure their producing a general sensation of the impossible. Let us analyze the separate subjects a little in this ideal work of Claude's.

"Perhaps there is no more impressive scene on earth than the solitary extent of the Campagna of Rome under evening light. Let the reader imagine himself for a moment withdrawn from the sounds and motion of the living world, and sent forth alone into this wild and wasted plain. The earth yields and crumbles beneath his foot, tread he never so lightly, for its substance is white, hollow, and carious, like the dusty wreck of the bones of men. The long knotted grass waves and tosses feebly in the evening wind, and the shadows of its motion shake feverishly along the banks of ruin that lift themselves to the sunlight. Hillocks of mouldering earth heave around him, as if the dead beneath were struggling in their sleep; scattered blocks of black stone, four-square remants of mighty edifices, not one left upon another, lie upon them to keep them down. A dull purple poisonous haze stretches level along the desert, veiling its spectral wrecks of massy ruins, on whose rents the red light rests, like a dying fire on defiled altars. The blue ridge of the Alban Mount lifts itself against a solemn space of green, clear, quiet sky. Watch-towers of dark clouds stand steadfastly along the promontories of the Apennines. From the plain to the mountains, the shattered aqueducts, pier beyond pier, melt into the darkness, like shadowy and countless troops of funeral mourners, passing from a nation's grave.

"Let us, with Claude, make a few 'ideal' alterations in this landscape. First, we will reduce the multitudinous precipices of the Appennines to four sugar-loaves. Secondly, we will remove the Alban Mount, and put a large dust-heap in its stead. Next we will knock down the greater part of the aqueducts, and leave only an arch or two, that their infinity of length may no longer be painful from its monotony. For the purple mist and declining sun, we will substitute a bright blue sky, with round white clouds. Finally, we will get rid of the unpleasant ruins in the foreground; we will plant some handsome trees therein, we will send for some fiddlers, and get up a dance, and a picnic party.

"It will be found, throughout the picture, that the same species of improvement is made on the materials which Claude had ready to his hand. The descending slopes of the city of Rome, towards the pyramid of Caius Cestius, supply not only lines of the most exquisite variety and beauty, but matter for contemplation and reflection in every fragment of their buildings. This passage has been idealized by Claude into a set of similar round towers, respecting which no idea can be formed but that they are uninhabitable, and to which no interest can be attached, beyond the difficulty of conjecturing what they could have been built for. The ruins of the temple are rendered unimpressive by the juxtaposition of the water-mill, and inexplicable by the introduction of the Roman soldiers. The glide of the muddy streams of the melancholy Tiber and Anio through the Campagna is impressive in itself, but altogether ceases to be so, when we disturb their stillness of motion by a weir, adorn their neglected flow with a handsome bridge, and cover their solitary surface with punts, nets, and fishermen.

"It cannot, I think, be expected that landscapes like this should have any effect on the human heart, except to harden or to degrade it; to lead it from the love of what is simple, earnest and pure, to what is as sophisticated and corrupt in arrangement, as erring and imperfect in detail. So long as such works are held up for imitation, landscape painting must be a manufacture, its productions must be toys, and its patrons must be children."

These golden words will, I hope, sink deep into the minds of all photographers who are tempted *to arrange* their subjects so as to obtain "pretty" or "effective" pictures.

This somewhat theoretical preamble, though dealing largely with the arts generally, yet has much direct bearing upon your own art of photography, but as my chief concern to-night is to consider photography in its relation to process reproduction, I would ask those of you who take photographs for reproduction by process to follow me during a brief consideration of your portion of the work.

In the first place, the arrangement of the subject when left to you is so very important. If it is a portrait, you have merely to remark in your blandest tones to your sitter, "Will you now *smile* a little, please? Ah! kindly remain like that for a moment!" and you have ruined your picture. If it is an inanimate subject on which you are inflicting the torture, will you please see that it *is* the object which you are photographing, and not half a dozen other things? Rely upon it that if you arrange things "artistically" you will produce a suburban effect.

If you have a given rural scene to photograph, and the selection of the most artistic "bit" or point of view is left to you, you will remember that before exposing your plate you must consider the best aspect of lighting, and decide whether the shadows are to be at their longest or at their shortest; the composition; the question of perspective, the use of short, medium, or long-focus lens. Consider in your focusing whether the foreground or the near middle-distance is to be "sharp,' and select your diaphragm with equal attention to the necessity of greater or less sharpness in the distance. The length of exposure can only be decided by the attendant circumstances; but never forget that, after all, a good sharp silver print is the best for all ordinary processes.

These may be small and unimportant points, but they are everything to a conscientious Art Editor, for

> "Artists should descry abundant worth
> In trivial commonplace, nor groan at dearth
> If fortune bade the painter's craft be plied
> In vulgar town and country!"

So far I may have addressed my remarks more to photographers than to process workers, and largely because without a good photograph the process worker can do very little indeed. In fact, no amount of hand engraving on a zinc block can ever give such a satisfactory result as a half-tone reproduction from a good original. Everyone in this room is probably sufficiently interested in the modern mechanical methods of producing illustrations for the press to have watched with interest the development of the employment of hand engraving upon zinc or copper blocks. I have watched it—and wept. I do not say that the graver may not be used with effect at times, but the times must indeed be out of joint if it is constantly needed. There is a fashion in everything, and a few months ago you could seldom take up a copy of *The Illustrated London News* without seeing what havoc the engraver had played with otherwise comparatively harmless half-tone reproductions. I have very fresh in my memory a full-page reproduction of a picture of the Naval Brigade—a branch of our aggressive fellow countrymen of which every photographer is doubtless proud. It was a wonderful example of what ought not to have been done. The ample collar of every member of the Brigade had been hacked out of the block, so that at a short distance the illustration appeared to represent a series of heads separated from a series of chests, legs, and boots by a respectable interval of whitewashed barrack wall which, somehow or other, had protruded itself to the total elimination of three score British necks which had never bent beneath the foreign yoke

It was a very bad example of the damage that the graver may do to an otherwise respectable block, and you can see for yourself any day, in other directions, how dangerous this little tool is.

There was an agency for the supply of illustrations started some time ago, and curiosity led me to visit it. There I found six engravers busily occupied in spoiling good, honest half-tone reproductions and charging very handsomely for their services. I believe that the concern was very soon in the hands of the Official Receiver, and has not yet escaped from the tender care of that inquisitive gentleman. It existed long enough, however, and the papers for which it mainly worked suffered sufficiently during the short period of its florescence to convince me that, generally speaking, the half tone block which requires engraving upon is generally a bad block and can never be made a good one It is much better to accept the limitations of whatever material you are working in, and to obtain your effects within the limitations your method of working imposes than to endeavor to put new cloth into an old garment or new wine into old bottles. In all probability some of you here could confront me with successful examples of engraved half-tone blocks, or, as they are called, blocks *with a wood-cut finish*. I am aware that such blocks exist, especially in the birthplace of process engraving, the United States of America. But I think I could prove to you that in almost every instance the blocks were bad blocks to commence with, and were only made less bad by the wood-cut finish, and were never made good.

The reason of this is, it seems to me, that the meaning of the term half-tone engraving is lost sight of, for the moment the graver is set upon a copper or zinc block it cuts away half-tones, and leaves solid white lines or spaces. I need not tell you, gentlemen, that there is no such thing as white, at least I have not as yet seen it. We call the snow white, but woe betide the painter who would endeavor to realize the effect produced upon the optic nerves by a snow-clad landscape with pure flake white. Exactly the same disaster dogs the footsteps of the reproducer who sets out to improve the imperfections of a half-tone engraving. He may do a good deal to a bad block, but he can only deal badly with a good block. He may cast out one one devil, but he will gather unto himself seven others worse than the first. The best thing to do, gentlemen, is a hard thing—the best thing always seems hard, for Truth is always strong—and needs courage. It is to refuse to reproduce from a bad original, and if this refusal is an Utopian fallacy, the next best thing is to warn your customer that you are not likely to obtain as good a result as you could wish. This is what I should advise if you are dealing with a man who knows the difference between a good and a bad block. If you are not, you must, I suppose, amiably accept the order, and with equal amiability send the block in, and if questions are raised, shelter yourself behind the time-honored device of blaming either the photographer or the printer. I should advise you to select the latter, because it is an accepted heresy that most printers fail to print half-tone engravings, and the majority of large printing establishments are so miraculously subdivided into departments that every printer has a loophole of escape. He can always blame the papermaker—especially if he does not supply the paper, and if that fails can fall back behind his second line of defense—the inkmaker—always leaving the way clear for a final retreat, in case of hot pursuit, behind his foreman. I am well acquainted with many printers, and I am deeply attached to some of them, but I will say that they are experts in the art of convincing you that whoever isn't right they are never wrong. The practical printer, as probably you are aware commences life as a " devil " or a "turnover," and he remains all his life as nimble in device as the one and as sweet in adversity as the other.

To return, however, to the wood cut finish.

I have spoken so far of the use of the graver and have not mentioned a much more valuable tool—the roulette. With this in hand the process engraver can do much to improve a block, and very little to spoil it. The *roulette* is a toning machine, and therefore much better suited for employment upon half-tone engravings than the graver. You can use it to advantage upon most backgrounds, and you may often secure by its use half-tone which will not come by direct process. I would recommend this little tool to your careful attention with as much light-hearted enthusiasm as I warn you of graver dangers.

And my reason is mainly this:

"Black and white"—unless expressed by means fo lines—should never be black and white! You have a worthy and useful process of reproduction in your half-tones, and you must not be led away by the all-too-prevalent endeavor to obtain merely black and white results. As I have already said, there is no such thing as white in Nature, and there is certainly no such thing as black. Think mainly of your half-tones. Strive to get tone and value into your block. Make your blacks and your whites, black and white in relation to their surroundings, and soothe everything into a similarity to Nature by the value of the half-tone. Nothing is so dissatisfying as a gray black; but nothing is worse than a block which is all black and white.

Every reproducer who aims at obtaining good results must have something of the artist in him, and must mentally compare every process block he produces with the effects of light and shade, the atmosphere of Nature which surround him. Hardly a day passes without some example of the popular fallacy that black and white are the chief essentials in reproductions being forced under my notice. You can see it in such a paper as the *Navy and Army Illustrated*. Here we have illustrations with the black forced to a pitch of Ethiopian darkness and the white made to shriek aloud. It is the darkness of ignorance and the shrieks of the false prophets. Not a little of this falseness of effect—in which the faces of the people are made to glitter like common pottery, and everthing else to glisten like new patent-leather boots—is secured at much cost by the use of what is called art paper. Was there ever a greater misnomer? The stiff pasty, glittering surface of it takes the texture out of everything, and instead of a picture you are left with paper and ink. I can only liken the difference between such printing upon such paper and what ought to be obtained by the use of a less luminous ink and a paper which absorbs the ink sufficiently to get rid of the sticky varnish which is considered so beautiful, to the difference between the glaze of an old Dutch tile and that of a modern half-guinea dinner set complete in forty-eight pieces (I would that most of them were in a thousand pieces).

You will object, perhaps, that the printing is no concern of yours, but every artist has a right to complain if his work is put to a base use, and I am glad to see that of late more than one process firm has established printing works in connection with their original business. Let me then ask you to remember that in making a half-tone reproduction you should never forget the half-way house.

Finally, let me summarize my thoughts, and if I have seemed somewhat over-emphatic you must put it down to a desire to see the half-tone process used with intelligence. When you remember how many illustrated periodicals there are in this country, and that during last year there were no less than 7,926 new books and new editions published in Great Britain and Ireland alone, many of them illustrated, you will see how great an industry this is in which so many of you are engaged, and how great a factor for artistic good or evil the process block is.

Remember then that—

"Wood-cut finish" can seldom improve a good block; that

"Black and white" is not so important as tone and atmosphere;

That a silver print is preferable to all other forms of prints.

That the blocks you make are to be printed upon machines;

That the original is more than half the battle;

That the makers of photographs for reproduction *must* consider the proper lighting, the focus, and the arrangement of their subject;

That punctuality is all-essential, especially if you are dealing with the poor persecuted Art Editor.

Our Readers will perhaps notice an advertisement which appears in this issue of a new exposure meter, called an Expodak.

It is an ingenious little instrument, its merit lying chiefly in its simplicity.

It is different from previous exposure meters that we have seen in that no specially prepared bromide paper is used for finding out the light value, any ordinary printing out paper doing just as well, and perhaps better, owing to the particular manner in which it is used.

The tables are also extremely simple, and once the table is set for a particular speed of plate, only one slide is removed to find out the exposure required without any stop, in any light, and for any subject. It is a simple, compact, and practical little instrument, which will probably be largely used by amateurs having difficulty in exposing correctly.

NOTES AND NEWS

The Lovell Dry Plate Company has removed to New Rochelle, N. Y., from Portland, Me.

The International Photographic Exhibition, recently held at the Crystal Palace Exhibition was a great success.

Freeman Halsted, the newspaper correspondent who was condemned to nine years' imprisonment for taking photographs of the fortifications of San Juan de Porto Rico, has been conveyed to a convict camp, in order to undergo his sentence.

COULDN'T STAND THE STRAIN.

"Have I got the 'pleasing expression' you want?" asked Mr. Billus.

"Yes, sir," replied the photographer. "I think that will do very well."

"Then hurry up, please. It hurts my face."—Tid-Bits.

Stop Thief.—A studio lens belonging to a Photographic Club, has recently been stolen from the club rooms, of which the following is a description: A No. 9 Ross Universal Symmetrical Lens; equiv. focus 20 inches; diameter of lenses 3¾ inches. When stolen, lens was attached to camera front board, 8½ inches square, with a "Low" shutter fastened to back of it.

Very sincerely,
Joseph Prince Loud,
President Boston Camera Club.

An Attractive Novelty in card mounts comes from the well-known house of the A. M. Collins Manufacturing Co., Philadelphia. The new style is called "Uniola," and is in white and in delicate tints that harmonize admirably with the colorings of the latest styles of photographs. They have an embossed border, and square beveled edges. They are adapted for mounting either horizontal or vertical photographs.

A Non-Poisonous Intensifier.—Soak the negative in the water till soft, then drain and immerse in—

Ammonia	1 ounce
Water	1 ounce

for a minute and a half, and then place in

Cadmium bromide	15 grains
Alcohol	35 ounces

till sufficiently intensified.

The Nebraska Convention will be held at Omaha, August 16th, 17th, and 18th, when the Trans-Mississippi Exposition will be in its prime. Many features of interest are being arranged for, and a profitable gathering is expected. The convention will hold its sessions in the mornings, leaving the afternoons free to those who desire to attend the great Exposition. Full particulars regarding exhibit space, etc , may be had from the Secretary, W. P. Fritz, Fremont, Neb.

Royal Photographic Society's Exhibition.—The Exhibition at Crystal Palace remained open three weeks, some 75,000 people having visited it, and was brought to a conclusion by a Conversazione, opening with a reception by the President (The Right Hon. the Earl of Crawford, K. T., F. R. S.) A large gathering of members of the Royal Society and others were present. A dinner was also given by the exhibitors to the executive, which function took place at the Holborn Restaurant. A deficit of about £100 was found to have accrued on the working of the Exhibition, which loss would have fallen on the Royal Photographic Society. However. several of the exhibitors, with praiseworthy generosity, made up the deficit among themselves.

An Unpleasant Adventure recently befell Mr. Frank Jackson, an amateur photographer in Sunny Spain. At Bilboa he went ashore and "snapped" a few typical scenes. As he was on the point of embarking for his steamer, the military police took charge of camera and tourist. He was brought before a board of military officers (who did not understand a word of English), and was, after a brief examination, imprisoned in a dungeon. Finally, after three days' incarceration, he was released, owing to the exertions of the British Consul, minus his camera. The moral is, "Don't spend your holiday in Spain" while the war game is being played. If you decide to go, take a passport, and leave your camera at home.—*Amateur Photographer* (English).

"**I have** received the Woodbury Encyclopædic Dictionary of Photography, and having very carefully gone over it, I feel it but your due that I should express my most hearty appreciation of the book, and as an amateur in the beautiful Art of Photography should also say that you will be doing every amateur a great and personal favor that you can induce to purchase a copy.

Groping in the dark to a greater or less extent, as most amateurs are on many subjects and points, this Dictionary, truly and most emphatically, "fills a longfelt want." The clearness, conciseness and comprehensiveness that characterize its definitions make it invaluable, and it thus forms a Library on Photography within itself. There is nothing abstruse about it or in it. Mr. Woodbury is most happy in his definitions and explanations; and there are many, very many, singly and alone, that are full worth the cost of the book, looking at it, as I do, from a purely amateur standpoint."

V. S. Mac Nider, M. D.

PHILADELPHIA PHOTOGRAPHIC SALON.

The Pennsylvania Academy of the fine arts and the Photographic Society of Philadelphia will hold a Salon Exhibition at the Galleries of the Academy, Broad Street, above Arch, Philadelphia, Pennsylvania, U. S. A , on October 24 to November 12, 1898.

The purpose of this Exhibition is to show only such pictures produced by photography as may give distinct evidence of individual artistic feeling and execution.

From the pictures submitted for exhibition a selection will be made by a jury chosen because of their reputation as artists and photographers Only such pictures will be hung, as in the opinion of the jury, may be most fully within the scope of the exhibition as expressed above.

No pictures will be accepted which have already been shown in Philadelphia at any exhibition open to the general public.

No special awards are offered, and no charge will be made to exhibitors.

Each exhibitor will be furnished with a certificate of the acceptance of his work.

No pictures, whether accepted or not, can be removed before the close of the Exhibition.

Framing, though desirable, is not obligatory, but all prints must be mounted. No exhibitor may submit more than ten pictures, each of which must be framed or mounted separately.

The title of each picture and the exhibitor's name and address must be clearly written on the labels provided, which must be attached by the exhibitor to the back of each picture.

Nothing may appear on front of picture except the title and exhibitor's name.

Arrangements will be made for the sale of pictures if desired, subject to a commission of fifteen per cent.

The management will not be responsible for any loss or damage to pictures in its charge, but will use all reasonable care to prevent such occurrence.

All pictures submitted for exhibition must be addressed to the Pennsylvania Academy of the Fine Arts, Broad Street, above Arch, Philadelphia, Penna., U. S. A., forwarded at owner's risk, carriage prepaid, and delivered not later than October 8, 1898. Return charges must be collected by carrier.

Pictures from abroad, if delivered not later than September 1, carriage prepaid, to Mr. Walter D. Welford, 19 Southampton Building, Chancery Lane, W. C., London, England, marked "For the Philadelphia Photographic Salon," will be transported to the Exhibition and returned to London, free of all expense to the exhibitor. Circulars, entry forms, labels, etc., may be obtained from Mr. Welford.

United States Custom House charges on all foreign exhibits will be borne by the management.

An illustrated catalogue will be published, copies of which will be on sale at the galleries during the Exhibition at twenty-five cents each. Each exhibitor will be furnished with a copy free.

To facilitate the labor of selection and preparation of catalogue, exhibitors are requested to anticipate the final date of delivery as much as possible.

The Jury of Selection will be WILLIAM M. CHASE, Painter, New York; ROBERT W. VONNOH, Painter, Philadelphia; ALICE BARBER STEPHENS, Illustrator, Philadelphia; ALFRED STIEGLITZ, Photographer, New York; ROBERT S. REDFIELD, Photographer, Philadelphia.

Further particulars and entry forms can be obtained from Mr. Robert S. Redfield, 1601 Callowhill St., Philadelphia, Pa.

One Hundred Dollars for a Photograph!—*The Ladies' Home Journal* stands ready to give that amount. Pictures of pretty suburban houses are what it wants no matter where situated.

The prizes offered for the photographs are:

First—$100.

Second—Two, of $50 each.

Third—Four, of $25 each.

Fourth—Ten, of $10 each.

Fifth—Twenty, of $5 each

Thirty-seven prizes in all: $500.

Photographs of any size will be admitted: large enough, though, to show some of the surrounding trees or shrubbery. But—and this is an important fact—the houses need not be owned nor occupied by competitors for these prizes. If you know of a pretty house anywhere the *Journal* would like a photograph of it. There is no limit to the number of photographs any competitor may send. Besides the thirty-seven prize pictures the *Journal* will pay liberal rates for more if accepted. Write on the back of each photograph, "Suburban House," giving its location, and add your address. No picture received after October 1 will be eligible for competition. All pictures should be sent to *The Ladies' Home Journal's* Art Bureau, Philadelphia, Pa.

$100 FOR PICTURES OF GIRLS' ROOMS.

The Ladies' Home Journal makes the following offers: For the best photograph of a girl's room taken anywhere in this country, a prize of $50. For the five photographs next in merit, $10 each.

The pictures need not be taken especially for the *Journal*. You may have in your possession a photograph that would prove to be a prize winner.

All photographs should be marked "Girls' Rooms," and must be sent, before September 1, to the Art Bureau of *The Ladies' Home Journal*, Philadelphia.

VIEWS OF PRETTY GARDENS.

It makes no difference what kind of a garden you choose—flower, fruit, or vegetable, back yard, front yard, or roof garden—so long as the garden makes a pleasing picture. For the best view a prize of $25 will be awarded; then there are five second prizes of $10 each, and five of $5 each. All photographs should be sent to the Art Bureau of the *Journal* before September 1.

FLOWERED PIAZZAS AND PORCHES.

The *Journal* would like some pictures of attractive piazzas. To encourage the sending of such pictures the *Journal* agrees to give three prizes, $15, $10 and $5, for the best three received. All photographs should be marked "Piazzas," and must be sent to the *Journal's* Art Bureau before October 1.

Address all packages to *The Ladies' Home Journal* Art Bureau, the Curtis Publishing Company, Philadelphia.

THE CHAUTAUQUA CONVENTION.

The 18th Convention of the Photographers' Association of America will mark a distinct advance over the policy of former years, most especially in the system of marking exhibits. The three divisions, viz: Posing, Lighting, and Chemical effect, are a relic of wet plate days when the operator's skill was mechanical rather than artistic. That this system should have prevailed for so many years proves that creative ability is a comparatively new field for the photographer, a position he has been forced into in self defense. Although he has been somewhat slow in adopting it he has not been at all slow in perfecting himself in it. It is not at all in keeping with the character and aims of this Association that it has not sooner recognized and encouraged this artistic tendency. Some excellent exhibits at the last Convention were not properly recognized through the inability of the judges, under the system of marking prescribed, to give them any credit for their good qualities. At the coming meet the judges will not be hampered by these restrictions. This does not mean that the impressionistic picture, whose merit depends upon the imagination of the spectator, will be the standard. It means that any honest effort to obtain "breadth," "tone," and other artistic qualities will receive due consideration, but we cannot ignore the Artisan for the Artist. Our profession demands first of all good workmanship. The old fashioned question box will be a feature of the morning sessions and every endeavor made to have its discussions interesting and profitable. Those who believe in the higher development of photography will be pleased to note that all size restrictions have been removed from the "Genre" class, and that artistic conception will be given its full value. Prof Griffiths will give a half hour's talk each morning. A large part of this time will be devoted to practical criticism of the pietures on exhibition. Prof. Griffiths has the happy faculty of entertaining his audience so well that the instruction never becomes tedious.

The American Aristotype Company will continue their school of instruction. Past experience has taught them the needs and limitations of such instruction. Their plans are laid for a systematic course that will well repay one for the entire expense of attending the Convention. The medals for 1898 are the handsomest the association has ever given out. The class and grade of same will be engraved on the back, with a blank space for the name of the winner. The awards will be made and the medals delivered the second day of the Convention. The winning exhibits will be decorated with ribbons, a separate color for each grade, a feature that will materially assist in comparing their merits. The judges will perform their work before the Convention opens.

In order that this part of the program may be carried out, we would call your special attention to rule No. 5 in the prize list, viz: that all exhibits *must* be in Jamestown on or before July 1st. This rule will be strictly adhered to. No exhibits will be taken from the express offices after that date. The Association will have the advantage of the very liberal reduction in R. R. rates that were given last year. Full information in this regard together with a list of hotels and rates will be published later.

Remit dues to Geo. W. Varney, 3937 Drexel Boulevard, Chicago.

Apply to the Secretary for entry blanks and prize lists and any further information.

J. Will Kelmer, *President*,
Hazleton, Pa.

Geo. B. Sperry, *Secretary*,
319 Summit St., Toledo, O.

Captain Abney on Photographic Films.—Captain W. De W. Abney, F. R. S., read an interesting paper at the Royal Photographic Society on June 21st, on his investigations into the facts revealed by microphotographic examination of sections of gelatine films containing silver images. Glass plates do not readily lend themselves to the purpose, as one does not want to work with small sections of glass, and although an ordinary film may, of course, be stripped by means of dilute hydrochloric acid, there would be a chance of damaging the object of the experiment in the case of intensified images. Captain Abney consequently employed celloidin films for his experiments, dissolving away with amyl acetate the celloidin support instead of stripping the film, the film being afterwards washed in spirit. These films were then prepared for cutting in the microtome, by the use of paraffin wax, and cut to a thickness of 1-300 of a millimeter in those shown at this meeting. Captain Abney then showed that the grains of silver in the section of the film were of approximately one size, and, as was to be expected, with small exposures the majority of the particles were gathered together at the exposed surface of the film, spreading, as the exposure increases, through the film. A section of undeveloped film was shown alongside, exhibiting a regular mass of silver bromide throughout, and there was likewise a grating photograph of some 6,000 lines to the inch for comparing the magnification. This grating photograph was produced by contact with a ruled glass surface made by Rutherford's machine, and was on bichromated gelatine. Such reproductions often give brighter spectra than does the original, for the reason possibly that the furrows were represented by transparent spaces, and the unruled parts by dark lines. To revert to the subject of the paper, it was not a difficult job to count the grains of silver, and by applying what Captain Abney styles the co-efficient of obstruction to the number, the results run very near to those obtained from the measured light traversing the original film. Reversal was shown to commence at the outside surface of the film, the grains there beginning to diminish in size, and this confirms the result of chemical experiment described by Captain Abney in an earlier paper, showing that prolonged action undoes the initial action of light. With very prolonged exposures the grains grow smaller and smaller at the exposed surface, the rear ones remaining of some size, but the number of particles in over-exposed and fully exposed portions are alike differing only in size. Still further exposure robs the film of almost all appearance of the grains, but absolute transparency, he believes, is never reached, owing to the presence of the dots of silver, which, however, require strong magnification to be visible. It was shown, also, that the thickness of properly and increasingly exposed films increased, as the particles increased in number when developed with metol, which was to be expected but with astringent developers, such as pyro, the thickness does not appear to vary. The action of intensifers, by examination in a similar way, is to produce an increase in the size of particles and the formation of particles not before apparently existing. Some films showing what takes place were exhibited, and the theory explained. The paper is a forerunner to a more elaborate communication, in which many details not given on the present occasion will be published.

Photographic Exhibition, under the auspices of the Photographic Section, American Institute, in connection with the Sixty-Seventh Annual Fair, will be held in the National Academy of Design, 23d Street and Fourth Avenue, New York City, September and October, 1898.

The Judges will be Charles I. Berg, Esq.; William M. Murray, Esq.; W. M. Hollinger, Esq ; Photographers. J. Caroll Beckwith, Esq., N.A.: A. T. Bricher, Esq. A.N.A.; Artists. Edward Bierstadt, Esq., Photo-Mechanical.

The exhibition will open on Monday, September 26th, and close on Saturday, October 8, 1898.

Conditions.

1. *Framing*—All pictures must be mounted and framed. Stereoscopic and lantern slides must be sent unframed; suitable arrangements will be made for displaying them.

2. *Labels and Frames.*—Full particulars for catalogue must be given on a label pasted on the back of each frame. Labels will be supplied on receipt of Entry Form A. Lantern slides and stereoscopic pictures to have the label attached to the package. When pictures are for sale, the price, with or without frame, must be stated on the label, also on Form B.

3. *Entrance Fees.—No Entrance Fee will be charged.*

4. *Date of Delivery.*—All entries must be delivered carriage paid, at the American Institute, Nos. 111, 113, 115 West 38th Street, between Monday, September 5th and Monday, September 12th, and Form B must be sent to the Secretary as a letter of advice when the cases are despatched.

5 *Method of Packing.*—Boxes containing pictures must be *screwed*, instead of nailed, and your home address must be marked on under side of cover for return of pictures. The Institute will not be responsible for packages marked in any other way.

6. *Non-responsibility.*—The Committee will unpack, repack and deliver to carriers all exhibits free of charge, but will not be responsible for damage. Experienced men will be engaged to do the work, and every care will be taken of exhibits.

7. *Awards.*—A minimum number of pictures, as specified in the annexed Schedule, must be entered in each Class, but an award shall be made for one picture only, except where, from the nature of the subject, the pictures bear an obvious relationship to one another. No exhibitor can gain more than one award in any Class. The Class for which any exhibit is entered must be stated on Form B. No picture can compete in more than one Class, with the exception of Class 8, Lantern Slides.

8. It shall be stated in Form B to what extent the work sent for competition is that of the exhibitor.

9. *Champion Class.*—No restrictions will be imposed as to the date of production, or as to previous exhibition of any picture; but a picture which has gained an award in any Class at any open exhibition can compete only in the Champion Class. A declaration must appear on Form B that pictures have or have not gained such an award. This condition does not apply to awards gained at exhibitions of photographic societies confined to members.

10. *Powers of Judges.*—All exhibits are subject to the approval or rejection of the Judges. The award of the Judges shall be final. They shall have power to withhold, or to increase, awards in any Class.

11. *Medals.*—Only medals from the die of the Institute will be awarded, and no medals for advertising purposes will be accepted.

12. *Non-competitive.*—Pictures may be sent for exhibition in a non-competitive Class.

13. *Sale of Exhibits.*—A commission of 15 per cent. will be charged on sale of all pictures.

Schedule of Classes.

In the whole of these Classes any printing process may be employed, and pictures may be of any size. Enlargements may compete in any Class. A minimum number of pictures, as specified below, must be entered in each Class, but any greater number may be sent if desired. *No distinction will be made between amateurs and professionals.*

Medals, as specified, will be awarded, at the discretion of the Judges, in the following Classes:

1. Portraits and Groups, 1 Gold, 2 Silver, and 4 Bronze Medals, 3 pictures.

2. Landscapes (with or without figures), Seascapes and Marine subjects, 1 Gold, 2 Silver, and 4 Bronze Medals, 3 pictures.

3. Architecture (exterior and interior), 1 Silver and 1 Bronze Medal, 3 pictures.

4. Animal Studies, 1 Silver and 1 Bronze Medal, 3 pictures.

5. Scientific, 2 Silver and 2 Bronze Medals, 3 pictures. (Photo-micrography, radiographs, astronomical and meteorological photographs, and other purely scientific work.)

The Judges to have power to call in expert opinion if necessary.

6. General Class (Flowers, Still Life, and other subjects not included in other classes , 1 Silver and 1 Bronze Medal, 3 pictures.

7. Instantaneous and Hand Camera, 1 Silver and 1 Bronze Medal, 6 pictures.

8. Lantern Slides—*A.* Champion Class, open, 1 Silver and 1 Bronze Medal, 6 pictures. *B.* Excluding prize winners, 1 Silver and 1 Bronze Medal, 6 pictures.

9. Stereoscopic Work, 1 Silver and 1 Bronze Medal, 6 pictures.

10. Enlargements—Section *A.* Portraits, Groups and Figure Studies, 1 Silver and 1 Bronze Medal, 1 picture. Section *B.* Other subjects, 1 Silver and 1 Bronze Medal, 1 picture.

11. Genre, 1 Gold, 1 Silver and 1 Bronze Medal, 1 picture.

CHAMPION CLASS.

For pictures which have gained awards at other open exhibitions—*see Rule 8*. Two Gold Medals—one for Portraits, Groups, and Figure Studies; one for any other subject. One or more pictures may be entered in this Class.

LADIES' COMPETITION.

Open to lady amateurs only. One Silver and 1 Bronze Medal. Minimum of 3 pictures.

PHOTO-MECHANICAL SECTION.

The restrictions imposed in the previous Classes do not apply to this Section, the only stipulations being, that there must be a minimum entry of 3 pictures of each Class, and that the name of the process must be distinctly stated. Specimens illustrative of processes, as such, may be exhibited by arrangement with the Secretary.

The Classes are: 1. Photogravure; 2. Block-Process Printing; 3. Color Work. A Silver and a Bronze Medal will be awarded in each Class.

Entry Form and full particulars can be obtained from Dr. J. W. Bartlett, 149 West 94th Stieet, N. Y. City.

Pyrocatechine.—The ideal developer has, at last, after many years of experimenting, been produced, chemically pure, by a secret process, at a price which will enable the photographer and amateur to use this advanced chemical agent, without being at more expense than he would in the case of hydroquinone or pyrogallic acid.

Pyrocatechine was strongly recommended by Prof. H. W. Vogel, as the best developer, and one which was capable of great possibilities, but owing to the great cost of the production of the chemical—which made it necessary to be sold at a very high price—coupled with the fact that it could not always be procured chemically pure, it was necessary to abandon it. However. Dr. Ludwig Ellon has, as announced in the foregoing, at last obtained the desired result.

The formulæ for pyrocatechine developer are as follows:

I. FOR ORDINARY PHOTOGRAPHING:
(ACCORDING TO MR. H. W. VOGEL.)

Water	1000 grammes
Crystallized sulphite of soda	25 grammes
Crystallized carbonate of soda	50 grammes
Pyrocatechine	10 grammes

II. ACCORDING TO MR. J M. EDER.

SOLUTION A.

Pyrocatechine	1 part
Sulphite of sodium	4 parts
Water	50 parts

SOLUTION B.

Potash	4 parts
Water	40 parts

1 volume of A is mixed with 2 volumes of B.

III. QUICKLY-WORKING DEVELOPER FOR ORDINARY AND INSTANTANEOUS DEVELOPER.

SOLUTION A.

Pyrocatechine	5 grammes
Crystallized sulphite of sodium	25 grammes
Water	250 grammes

SOLUTION B.

Ordinary crystallized phosphate of sodium	47 grammes
Caustic soda (purified in sticks)	5 grammes
Water	250 grammes

For use, mix one part of A with one part of B, and one part of water.

For diapositives prescription No 1 was followed.

For bromide paper the solution prepared according to prescription No. 1 is diluted with the same volume of water.

Mr. H. W. Vogel and Mr. P. Bannєke of the Royal Technical High School, Charlottenburg, make the folfowing remarks in the *Photogr. Mittheilungen*, 1898, Heft 1:

Messrs. Dr. Ludwig Ellon & Co. Chemical Works, Charlottenburg, sent us for trial some of their pyrocatechine, which is manufactured according to a patent process; *i. e.*, perfectly chemically pure. The preparation consists in small perfectly white crystals, which are easily soluble in water.

This product is conspicuous not only because of its pureness, but also because its price is considerably lower than that of the former pyrocatechine, whereby it is put on a par with many other developing substances now in use.

The negatives obtained according to Vogel's prescription (No. 1) proved to be of an excellent character, only the developing process is rather slow.

Messrs. Lumière were the first to draw attention to the employment of tribasic phosphate of sodium in place of the carbonate of alcali, and this substitute has proved to be very advantageous also for pyrocatechine. With the first-mentioned salts the developing process is a much quicker one, without the character of the negative suffering under it.

Messrs. Ellon & Co. have lately brought out a prescription which does away with the expensive tribasic phosphate of sodium, and which produces an energetic developer without the addition of bromide of potassium. The clearness and brilliancy of the negatives thus produced is preserved in spite of the accelerated development. For reecipt see above No. III.

This prescription has proved to be very successful for landscape, studio and instantaneous photographs; for other photographs we recommend the addition of the solution of bromide of potassium. The mixed developer could be used a second time.

The above two solutions may also be combined in one; this mixture possesses a considerable durability, the same as the above mentioned former prescription.

We have repeatedly pointed out the advantages of the pyrocatechine developer. It is not influenced by temperature; the solutions do not stain the fingers; it does not so easily incline to veil; the color, modulation, and clearness of the negatives is excellent (even without the addition of the bromide of potassium); the developing produces beautiful high-lights, so that we can well recommend the working with pyrocatechine.

We may also mention that, in working according to the last mentioned prescription, with caustic soda, no curling of the layers took place (Sach's Rapid plates were used).

As regards the working with pyrocatechine on bromide of silver paper, we have obtained splendid results with the above mentioned old receipt in a solution. In this case the developer was diluted with the same quantity of water.

Besides the clear whiteness, the photos showed beautiful pure gray down to black tones.

PATENTS OF THE MONTH.

GRANTED DURING THE MONTH OF JUNE, 1898.
(Furnished for the Photographic Times by William S. Hodges, Patent Lawyer, Washington, D. C.)

605,245. Photographic Finder. H. B. Carlton, Rochester, N. Y.

The finder consists of a hollow body having a lens tube and an inclined mirror. A plate, pervious to light, is located above the mirror, said plate being hollow in its upper surface. A spherical body is adapted to roll in the hollow in the plate, while four walls form an inclosure for the sphere. The rays of light are passed through the plate from within the tube to form an image.

606,318. Automatic Apparatus for Taking Photographs. R W. Vining, London, England.

This invention consists of tanks adapted to contain the developing and fixing solutions; carrier mechanism for immersing the negative successively in the solutions, and a motor for operating such mechanism, while a thermostat controls the speed of the motor. Means are provided for heating the liquid in the tanks. The operation of the parts is regulated by clock mechanism comprising a timing-disk and connections between said disk and the carrier mechanism.

606,394. Focusing Attachment for Cameras. David E. Sharrets, Washington, D. C.

A ground-glass frame has an oblong compound reflector, the latter being provided with pivots disposed at right angles to each other, whereby either vertical or horizontal pictures may be erected.

606,593. Photographic Copying Camera. Herman Stender, Prospect Park, Cal.

This is an improvement in the art of printing from negatives or positives, and it consists in intercepting the side rays of light by arranging a light-diffusing chamber in front of the negative or positive, and diffusing the light used in printing by passing it through light-diffusing screens arranged within such chamber.

606,594. Photographic Copying Camera. Herman Stender, Prospect Park, Cal.

The inventor has provided an enlarging camera with a negative or transparency holder; a vignette arranged in front of such holder, and a light-diffusing chamber arranged in front of the vignette.

TRADE MARKS.

31,654. Photographic Printing Paper. Western Camera Mfg. Co., Chicago and New York.

Essential feature, the word "Royal." Used since February 1, 1897.

31,655. Certain Photographic Apparatus and Material. Radiotint, Limited, London, Eng.

Essential feature, a figure representing the Assyrian symbol of the sun. Used since October, 1897.

31,706. Art Photographs. Curtis & Cameron, Boston, Mass.

Essential Feature, the word "Copley." Used since March, 1896.

ULTRA-VIOLET RAYS.—A term applied to the rays beyond the violet or high end of the spectrum. The vibrations of these rays are too rapid for vision, but they possess greater chemical activity than any others.

UMBRELLA TENT.—A kind of collapsible dark tent for changing or developing plates. It opens out like an umbrella, but has no stick in the center, and can be placed on a table or the ground, or hung to the bough of a tree.

UNDER-EXPOSURE.—Sensitive plates, films, or papers are said to be under-exposed when the action of the light has been insufficient. An under-exposed plate appears hard, the high lights developing very black, and the shadows remain clear glass. Under-exposed plates can rarely be improved. A strong developer should be used, and with the ferrous oxalate it is a common practice to add a few drops of a very dilute solution of hyposulphite of soda.

UNDULATORY THEORY.—The theory of light that has been generally adopted. It presupposes that there exists a universal ethereal medium, pervading all space, of infinite elasticity. The sensation of light is supposed to be caused by rapid undulations or waves in this impenetrable ether. Sir John Herschel gives the following table of the number of waves composed within the space of an inch, constituting differently colored lights, and also the number of each which strike upon an object (the eye, for instance) in one second of time:

Colors of the Spectrum.	Number of Undulations in an Inch.	Number of Undulations in a Second.	Colors of the Spectrum.	Number of Undulations in an Inch.	Number of Undulations in a Second.
Extreme red	37,640	458,000000,000000	Blue	51,110	622,000000,000000
Red	39,180	477,000000,000000	Indigo	54,070	658,000000,000000
Orange	41,610	506,000000,000000	Violet	57,490	699,000000,000000
Yellow	44,000	535,000000,000000	Extreme violet	59,750	727,000000,000000
Green	47,460	577,000000,000000			

UNIFORM SYSTEM.—A system of numbering diaphragms adopted by the Photographic Society of Great Britain, taking *f*4 as the standard, which is termed No. 1. The numbers are termed the U.S. numbers. (See **Diaphragm.**)

URANIUM (Symbol U; atomic weight, 180).—A valuable metal occurring as an impure oxide in pitch blende, and as carbonate in liebigite. The nitrate and the chloride are both used in photography. (See **Uranyl Nitrate** and **Uranyl Chloride.**)

URANIUM COLLODION PROCESS.—A collodion process devised by Wortley, in which uranium was used.

The formulæ are:

Plain collodion	10 ounces
Cadmium bromide	76 grains
Uranium nitrate	5 drachms
Silver nitrate	3 drachms

The manipulations necessary are precisely the same as with the ordinary collodion bromide emulsion process. The following is the preservative:

Tannin	80 grains
Gum arabic	48 grains
Sugar	32 grains
Water	8 ounces.
Gallic acid solution	4 drachms

The gallic acid solution consists of 1 part of gallic acid in 20 parts of alcohol.

The following is used as developer:

Water	320 minims
Alcohol	128 minims
Alcohol pyrogallic solution (1 in 10)	40 minims
Ammonium carbonate solution (1 in 8)	20 minims
Ammonium bromide solution (1 in 8)	20 minims

The pyro, water and alcohol solutions are first left to act by themselves, and the ammonium solutions are added later. With over-exposed plates more bromide, and with under-exposed plates more pyrogallic acid, solutions are used.

URANIUM INTENSIFIER.—See under **Intensification.**

URANIUM PRINTING.—Very pretty images can be made by this process. A variety of very pleasing terra cotta and other red colors can be obtained.

Paper is first floated for five minutes on a bath of

Uranyl nitrate	80 grains
Distilled water	1 ounce

This solution should be preserved in the dark. Instead of floating the paper the solution can be applied with a broad camel-hair brush, or a pad of wool.

When dry, the paper is exposed beneath the negative in sunlight, until the principal details are visible. It is then developed with one of the following:

1

Distilled water	1 ounce
Potassium ferricyanide	50 grains

This gives a reddish brown tone.

2

Distilled water	1 ounce
Silver nitrate	25 grains

Gives a dull gray image, which can be washed and toned in gold hyposulphite.

3

Gold chloride	1 grain
Distilled water	1 ounce

This should be brushed over the image, and gives a purplish black. The prints after development should be washed in 1 in 80 bath of hydrochloric acid, and then thoroughly washed again.*

URANIUM TONING.—See **Toning.**

URANOPHOTOGRAPHY.—See **Nomenclature.**

URANYL CHLORIDE (Formula UO_2 Cl_2; Synonyms, *Chloride of Uranium*, *Uranium Oxychloride*).—Prepared by dissolving uranic oxide in hydrochloric acid. It occurs in greenish yellow plates deliquescent and soluble in water and alcohol. Used for toning silver prints (see **Toning**). By the action of light uranyl chloride is converted into a mixture of uranous chloride and uranous oxide. Paper coated with a mixture of it and potassium chloroplatinite and exposed to light will with hot potassium oxalate develop a uranium and platinum image.

URANYL NITRATE (Formula UO_2 $(NO_3)_2+6H_2O$; synonyms, *Uranium oxynitrate*, *nitrate of uranium*).—Prepared by dissolving uranic oxide in nitric acid. Occurs in yellow fluorescent prismatic crystals, soluble in water and alcohol. By the action of light it is converted into a mixture of uranous nitrate and oxide. With a mixture of uranyl nitrate and nitrate of silver dissolved in collodion a printing-out paper can be made.

URIE'S MACHINE.—See **Automatic Printer.**

U.S.—See **Uniform System.**

VALENCY.—See **Automicity.**

VANADIUM (Symbol V; atomic weight 51.2).—The sensitiveness to light of the vanadium compounds, which the Brothers Lumière have so thoroughly studied, and which Gibbons records in the *Chemical News*, 1874, p. 267, has, I believe, not much practical importance in connection with positive printing. Those vanadates which I myself investigated (*Photo Archiv*, 1893, p. 210) only show sensitiveness on unsized paper, none on sized paper.

An aqueous solution of these salts may, however, be employed in actinometry. If a concentrated aqueous solution of vanadate of ammonia is mixed with its own volume of a 25 per cent. aqueous solution of tartaric acid, we obtain a clear, reddish-yellow fluid which undergoes no change in the dark, but on exposure to sunlight becomes dark olive, this occurring in about twenty minutes. During the next ten minutes the fluid becomes green, and finally blue, these stages being quite definite, and requiring no analytical means for indicating them. Should, however, a chemical reaction be required for tracing the changes, the following may be taken advantage of. The unexposed mixture of vanadate and tartaric acid gives, with diamidophenol, a soluble intensely brown-red coloring matter, and with hydrochlorate of paramidaphenol an intense violet color. When the vanadate mixture has been brought to the blue stage by exposure, these reactions do not take place, the mixture remaining almost colorless—or, at any rate, only slightly blue. Titration with permanganate of potassium may be adopted as a means of quantitatively determining the extent to which the light has acted.

A mixture of the vanadate of ammonium and citric acid is much less sensitive to light than the mixture containing tartaric acid, and the addition of alcohol still further reduces the sensitiveness. Mixtures prepared with sulphuric acid or with hydrochloric acid are insensitive.†

VARNISH.—A solution of resinous substances used for the purpose of forming protective coatings over the negative film, resisting the action of the air and moisture. Photographic varnishes are mostly volatile, that is to say, the solvent used can be evaporated by heat without decomposition.

---

*E. J. Wall. † Ed Liesegang.

A large number of formulæ for varnishes have been given from time to time. The following, however, have all been well tested, and have proved satisfactory :

Negative Varnish. (1.)

Sandarac resin	4 parts
Spirits of wine	20 parts
Chloroform	0.5 part
Oil of lavender	3 parts

In using this varnish, it is (after filtering) poured on to the glass plate and dried by the application of heat. It gives a perfectly colorless film, and does not crack no matter how long the negative be stored away.

Negative Varnish. (2.)

Orange shellac	2½ ounces
Mastic	½ ounce
Sandarac	2½ ounces
Oil of turpentine	½ ounce
Venice turpentine	½ ounce
Camphor	20 grains
Methylated spirit, 66 overproof	40 ounces

Some workers prefer the addition of 20 grains of mercuric nitrate, cupric nitrate or cupric sulphate to the above solution.

Negative Varnish (3.)

Sandarac	2 ounces
Venice turpentine	½ ounce
Oil of turpentine	1 ounce
Alcohol .825	20 ounces

This formula has been recommended by W. K. Burton. Pure methylated spirit 66 overproof can be used instead of alcohol, the cost being reduced by nearly one half. This varnish is of a pale color, and requires that the negative be warmed previous to coating. The film is very hard.

Negative Varnish. (4.)

Orange shellac	2 ounces
Sandarac	2 ounces
Canada balsam	60 grains
Oil of lavender	1 ounce
Methylated spirit	16 ounces

Like other shellac varnishes, this will require clearing to remove the wax in the lac, which is soluble in alcohol. This is done by shaking up kaolin, or prepared chalk, with the varnish, and allowing it to settle, or by treating shellac by methylated ether.

Negative Varnish. (5.)

Sandarac	2 ounces
Seed lac	1 to 1½ ounces
Castor oil	3 drachms
Oil of lavender	1½ drachms
Alcohol	18 fluid ounces

Negative Varnish. (6.)

Best white hard varnish	15 ounces
Methylated spirit	25 ounces

This is a quickly-made varnish; the formula for the "white hard" will be found elsewhere. Its only objection is that it takes rather longer to dry than other varnishes. It gives a very good film, however.

Negative Varnish. (7.)

Amber	2 parts
Copal	2 parts
Mastic	1 part
Petroleum naphtha	10 parts
Spirits of wine	20 parts

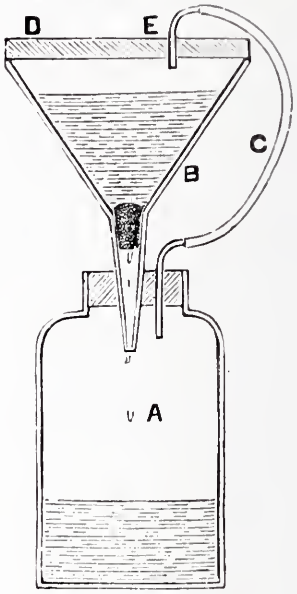
Negative Varnish. (8.)

Button lac	8 ounces
Sandarac	2 ounces
Methylated spirit	2 quarts

This is shaken at intervals for about a week and then filtered.

Negative Varnish. (9.)

Gum sandarac	½ ounce
Gum shellac	1 ounce
Methylated spirit	10 ounces



FILTER FOR VARNISH.
FIG. 474.

The two principal gums used in the manufacture of photographic varnishes are lac and sandarac, or gum juniper, as it is termed in the trade. Lac is somewhat harder than sandarac, but it has an objectionable red color, while sandarac is almost colorless. Lac varnish can be easily decolorized, however, by passing it through animal charcoal broken up into small pieces, and freed from salts contained in it by treating it with hydrochloric acid and washing. Seed lac is preferable to stick lac, as it possesses less color.

Owing to the viscous nature of varnishes some difficulty is usually experienced in their filtration. The length of time required for this operation allows of a considerable evaporation of the alcohol, benzole, or other solvent used. A simple apparatus for the perfect filtration of small quantities of volatile varnishes, without loss by evaporation, is given by Mr. H. C. Standage and reproduced here.

The following description of the arrangement is given:—*

"A is a large bottle, either of glass or tin. This is hermetically closed by a cork with two holes; a caoutchouc stopper is very handy in this case, or a wide bung. B is a glass funnel, the neck of which passes through one of the holes in the cork of A, while a piece of bent glass tubing, connected with a piece of indiarubber tubing C, passes through the other hole; a plug of cotton wool—medicated wool I find the best—is put in the neck of the funnel, or else a filter paper is used. I prefer the former for both spirit and volatile varnishes. The top of the funnel is ground smooth, and a piece of mahogany made to fit accurately thereon as a cap D. A ring of rubber placed on the underside of this cap renders it air-tight. In the center of this cap is a hole, through which passes a piece of bent-glass tubing E, which is connected with the other end of the rubber tubing C. The volatile varnish is placed in the funnel B, the cap put on, and as the varnish filters through into A, the air in the latter vessel is displaced, and passing through C, enters E, and so keeps up the equilibrium. The air in B becomes saturated with the vapor of the spirit; but, as such vapor cannot escape when the air is saturated therewith, no more vapor is given off from the varnish; thus, the consistency of the filtered varnish is uniform, which is not the case when it is filtered in an open funnel, because as the spirit evaporates, the proportion mixed with resin is lessened, and so the latter portion of varnish that is filtered becomes thicker than the first, due to this loss of spirit. When the plug of cotton-wool or filter-paper ceases to act well—*i. e.*, when the varnish filters very slowly—whatever is in B should be poured off, and the filtering body be replaced with fresh material."

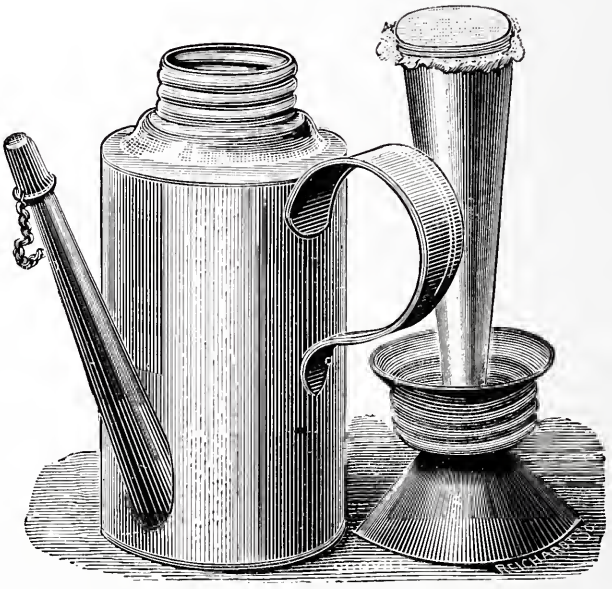


FIG. 475.—VARNISH CAN WITH FILTER.

Considerable care should be taken in the purchase of the raw materials used for varnishes, as it is very necessary that they should be free from color.

Retouching Varnish.—A varnish used for retouching. It gives a rough, biting surface, which takes the lead of the retouching pencil.

Negative Retouching Varnish (1.)

Sandarac	1 ounce
Castor oil	80 grains
Alcohol	6 ounces

First dissolve the sandarac in the alcohol and then add the castor oil.

Negative Retouching Varnish. (2.)

Shellac	0.035 ounce
Sandarac	0.21 ounce
Mastic	0.7 fluid drachms
Ether	0.21 ounce

2.7 parts of pure benzole are added after the resins have dissolved in the ether.

---

* *Photographic News*, June 19th, 1891.

NEGATIVE RETOUCHING VARNISH. (3.)

Sandarac	½ ounce
Canada balsam	1 drachm
Sulphuric ether	7 ounces
Benzole	3 ounces

This varnish is applied cold.

LUCKARDT'S RETOUCHING VARNISH.

Alcohol	300 parts
Sandarac	50 parts
Camphor	5 parts
Castor oil	10 parts
Venice turpentine	5 parts

Monckhoven's Retouching Varnish is made by placing shellac in a saturated solution of carbonate of ammonia in water. After twenty-four hours the solution is poured off, and replaced by the same quantity of water. This should be about in the proportion of 1 to 8. The fluid is boiled under constant stirring until the lac is all dissolved. The negative, which should be thoroughly dry, is coated twice with this varnish.

Cold Varnish.—A cold varnish is one that can be used without the necessity of heating the negative. These have found much favor with amateurs, who are usually more successful with them than with the other varnishes. The simplest is the following:—

Bleached shellac	3 ounces
Borax	1 ounce
Distilled water	25 ounces

One of the principal points in the manufacture of this varnish is that the shellac must be recently bleached, otherwise it will most likely be found insoluble. It should be broken up into small pieces and heated with the borax and a little water until hot, the remaining part of the water is then gradually added.

Very good cold varnishes are prepared with amyl acetate or acetone. Hydrated acetone can be used as a solvent of sandarac. Amyl acetate is used as a solvent of pyroxyline and a very good varnish is thus formed. The formula is—

Pyroxyline	15 grains
Acetate of amyl	1½ ounces

This is coated over the negative in the same manner as collodion. It requires from twelve to twenty-four hours to dry, but gives a very hard protective film.

Varnish for Paper Negatives, Photographs, etc.—An elastic varnish for paper negatives, photographs, etc., can be prepared as follows:—

Some clear and transparent piece of dammar are crushed into small pieces. About 40 grains of this is placed in a flask and about six ounces of acetone poured over it. This is exposed to a moderate temperature for about two weeks, frequently shaking. At the expiration of this time, the clear saturated solution of dammar is poured off, and to every four parts of varnish three parts of a rather dense collodion are added, the two solutions are mixed by agitation, and the resulting liquid is permitted to settle, when it is afterwards preserved in properly closed bottles. This varnish is applied by means of a soft beaver hairbrush in a vertical direction. When first applied, the paper appears as if covered with a thin white skin, but as soon as the varnish has become dry, it gives a clear, shiny surface. Two or three coats should be given. This varnish retains its gloss under all conditions of weather, and remains elastic, this quality adapting it admirably to the purpose of varnishing photographs, etc.

Another good varnish for protecting photographs, maps, drawings, etc., is the following:

Mastic	1 ounce
Sandarac	2 ounces
Powdered glass	2 ounces
Ether, methylated, .725	5 ounces
Methylated spirit	10 ounces

The use of the glass is merely as a clearing agent. This varnish should be filtered, and can be applied by means of a spray diffuser to drawings, bromide enlargements, etc.

Another formula for the same purpose is:

Water	320 parts
White gum lac	32 parts
Borax	8 parts
Carbonate of soda	2 parts
Glycerine	2 parts

Dissolve the borax and the carbonate of soda in 160 parts of warm water, then add the gum lac in small pieces and stir until solution is completed. Filter and add the glycerine and remainder of the water. After a day or two a deposit will settle, when the clear liquid is decanted.

A good varnish or lacquer for photographs can be prepared as follows:

Dammar	1.4 ounces
Acetone	6.3 ounces

The resin should be nearly dissolved in about a fortnight, if the bottle (well-stoppered) is allowed to stand in a warm place. The solution should then be poured off, and applied several times with a soft brush.

Varnish to Imitate Ground Glass.—This can be made with—

Sandarac	90 grains
Mastic	20 grains
Ether	2 ounces
Benzole	½ to 1½ ounces

The amount of benzole determines the nature of the matt obtained.

Colorless Varnish.—Dissolve 2½ ounces of shellac in a pint of rectified spirits of wine, boil for a few minutes with five ounces of well-burnt and recently-heated animal charcoal. A small portion of the solution should then be filtered, and if not colorless, more charcoal is added; when all the color is removed, press the liquid through a piece of silk, and afterwards filter through fine blotting paper. This varnish should be used in a room at 60 deg. Fahr. It dries in a few minutes, and is particularly suitable for prints, photographs, etc.

White Hard Varnish.—This is prepared as follows:

Sandarac	2 pounds
Spirits of wine	1 gallon
Venice turpentine	18 ounces

Fifteen parts of this, diluted with 25 parts of methylated spirit, forms a very good negative varnish.

Amber Varnish.—To make a good amber varnish, the following formula will be found a good one:

Amber	6 pounds
Oil of turpentine	4 gallons
Oil of linseed	2 gallons

Dead Black Varnish.—A very useful varnish for blackening the insides of the camera, dark slides, etc., can be prepared as follows:

Alcohol	8 ounces
Lampblack	2 ounces
Shellac	1 ounce

Dissolve the shellac in seven ounces of the alcohol, and mix the lampblack with the remaining ounce; then add the two together, and the varnish is formed. (See also **Black.**)

Anti-rust Varnish.—A varnish for preventing metal instruments, etc., from rusting:

Resin	120 parts
Sandarac	180 parts
Gum lac	60 parts
Essence of turpentine	120 parts

Take the first three ingredients in a powdered condition, and digest them by means of a regular heat until melted, then add the turpentine very gradually, stirring the whole time. The mixture should be digested until dissolution, then add rectified alcohol 180 parts. Filter through fine cloth on thick, bibulous paper, and preserve in well-stoppered bottles.

Varnish for Backing Positives.—This is made with—

Spirit of turpentine	6 ounces
Asphaltum	2 ounces
White wax	2 scruples
Lampblack	1½ scruples

Crystal Varnish for Ferrotypes.—

Dammar	25 grains
Benzole	1 ounce

Black Varnish.—

Gum sandarac	½ ounce
Gum shellac	1 ounce
Methylated spirit	10 ounces
Lampblack	2 ounces

Mix the lampblack with a little of the methylated spirit, and add to the gum solution. A black varnish similar to this is sold as Bates's Black, a very useful varnish for blocking out portions of negatives, and for a variety of other purposes.

Dissolve in a warm place, and filter through flannel.

Waterproof Varnish.—A useful varnish for coating wooden or paper dishes, which will then last some time, provided alkaline substances are not used in them.

Colophony	2¼ ounces
Shellac	½ ounce
Turpentine	9 ounces
Yellow wax	¼ ounce
Methylated spirit	20 ounces

Melt the wax in a water bath, and add the resin and lac, then the turpentine, and lastly the spirit.

Iodine Varnish.—Prepared by the addition of ½ to 1 part of iodine to 100 parts of negative varnish. It is used for coating the back of thin negatives to cause them to print slower, or it can be applied to parts only.

Varnish for Sketching Lantern Slides.—It is very often useful to have some method of writing or drawing on a piece of glass, to be used as a lantern slide. For this purpose the following varnish will be found serviceable:

Ether	50 parts
Sandarac	1 part
Mastic	1 part
Benzene	10 parts

This will give a rough surface, which can be used for drawing on. After the drawing or writing is made, it is flowed over with—

Ether	100 parts
Sandarac	3 parts
Mastic	3 parts

Which produces, when dry, a perfectly smooth and transparent surface.

Colored Varnishes.—Colored varnishes may be made with the following:

Seed lac	10 parts
Dried spirit	80 parts

To which is added any of the aniline colors soluble in alcohol. By this means an excellent ruby varnish can be made for dark-room windows, etc.

VARNISHING.—Negatives from which a number of prints are required or which are intended to be kept for probable future use should be varnished with a protecting coating of a lac solution. Suitable varnishes for all kinds of work will be found under **Varnish.**

The negative should be varnished as soon as it is quite dry, and should be handled as little as possible previous to the operation. Touching the surface of the film makes it repellent to the varnish, and consequently it is more difficult to get an even flow over the surface.

Negatives from which extra large quantities of prints are required should be given a preliminary coating of plain collodion.

Although the operation of coating a negative with varnish may seem simple enough, yet few manage it properly without considerable practice. First of all the varnish should be quite clean, and kept free from impurities, and before putting it on the plate should be carefully wiped over with a broad camel-hair brush. Another important consideration is that the room where the coating takes place be quite free from dust, as it is astonishing how soon particles of all sorts of matter floating in the air settle on the sticky plate. The first operation is to gently warm the negative, but not by any means to make it too hot. A little of the varnish is then poured on about the right hand top corner, and with a little manœuvering this pool can be made to run over the whole of the plate, and the surplus run off into a separate bottle kept for the purpose. The plate is then rocked in front of a clear fire or a vertical gas stove. If a pneumatic holder be used the whole of the plate can be coated, but if not, the bottom left hand corner is held by the ball of the thumb, and a small corner left uncoated.

Several methods of varnishing have been recently introduced, with which no heat is required.

Although a coating of varnish protects the sensitive gelative film from the influences of moisture, yet it is no proof against rain spots or drops of water, which, if not quickly removed, will soon work their way through the varnish and destroy the film.

VARNISH, REMOVING.—The varnish can be removed by means of a pad of cotton-wool saturated with spirits of wine or turpentine.

VASELENE, commonly called Vaseline.—A pale yellow translucent semi-solid substance, consisting of a mixture of the hydrocarbons $C_{16}H_{34}$ and $C_{20}H_{42}$, obtained by treating the undistilled portion of petroleum with superheated steam and filtering while hot through animal charcoal. It is insoluble in water, slightly soluble in alcohol, but dissolves freely in ether, chloroform, benzene, and turpentine, is miscible in all proportions with fixed and volatile oils, melts at 35 deg. to 40 deg., and commences to fume at 160 deg. Its density in the melted state is .840 to .866. Pure vaselene is not affected by air. It is used for a large variety of purposes. A little rubbed round a glass stopper will prevent it from sticking, and a layer over a corked bottle will effectually prevent the air from entering and destroying the contents. It is also used in making paper or paper negatives transparent.

VASELINE.—The popular name given to Vaselene (*q.v.*).

VEGETABLE PARCHMENT.—See **Parchment Paper.**

VEHICLE.—In order to spread the sensitive salts upon hard repelling substances, such as glass, etc., it is necessary that some substance be used wherein they may be suspended. The suspending substance is termed the "vehicle," and the ones commonly used are collodion, albumen, gelatine, etc.

VENICE TURPENTINE.—See **Turpentine,**

VENTILATION.—The ventilation of the rooms in which photographic operations are carried on is a point which should be carefully looked into. Too frequently is the dark room entirely without ventilation, and in consequence the health of the operator suffers. Many photographic sensitive materials, too, require to be stored in a properly-ventilated room. Plates, papers, etc., are often spoilt, and the cause apparently inexplicable. Usually the dealer or manufacturer suffers, when in reality the cause is due to their being stowed away on high shelves where foul air accumulates. In ventilating the dark-room care must, of course, be taken that light is not admitted at the same time. A convenient plan is to bore a number of holes (about 1 in. in diameter) in the bottom of the door, and outside a piece of wood is fixed in a slanting direction as shown in Fig. 476. This allows of the entrance of air without light. Another arrangement should be made somewhere high up the wall, close up to the ceiling, where the foul air can escape, so as to have a current of fresh air passing through, carrying away the noxious gases.

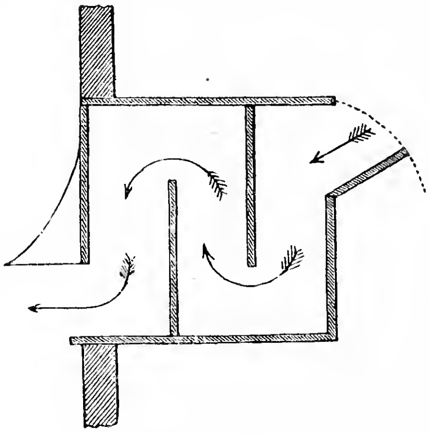


FIG. 476.

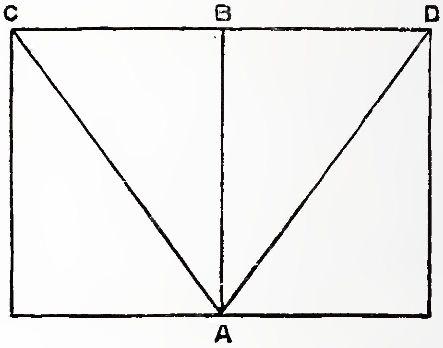


FIG. 477.

VERGARA FILM.—See **Woodbury Film,**

VEST CAMERA.—A small detective camera worn under the vest, the lens protruding through a button-hole. See Fig. 478. About six round pictures of the size of a half dollar are taken upon circular dry plates.

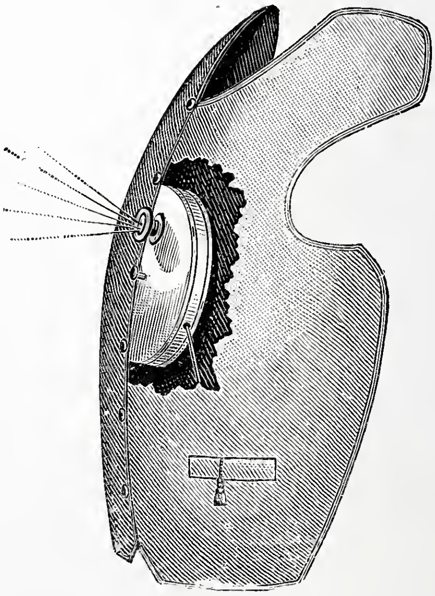


FIG. 478.—VEST CAMERA.

VERTICAL CAMERA.—See **Camera.**

VICTORIA SIZE.—A size of picture 3 × 4¼ inches, size of mount 3½ × 5 inches.

VIEW FINDER.—A little instrument used in instantaneous photography. In photographing rapidly moving objects it is necessary that some means should be employed to enable the operator to see whether or not the object will appear in its proper position on the plate. With a finder attached to the camera it is possible to see exactly when the object is in position on the plate, the shutter is instantly released and the picture secured.

There are various kinds of finders on the market, the usual form being that of a small camera obscura.

Wall gives a method in which the focusing screen is used. When turned back over the top of the camera, it should have the lines drawn on it, as shown in

Fig. 477. Then when the eye is placed at A looking along AB, the object when opposite this will be in the center of the plate, and CAD is the angle included by the lens. (See also **View Meter.**) The Scovill Magic Finder is a neat contrivance easily adjustable. (Fig. 479.)

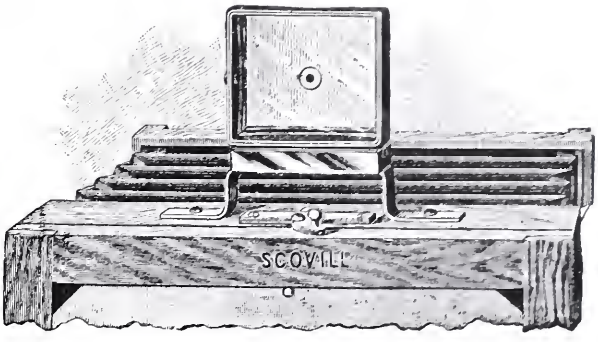


FIG. 479.—MAGIC FINDER.

Looking through the finder from the proper distance, toward the view to be taken, the operator sees before him a correct, right side up, and delightfully brilliant and sharp miniature picture of the view before him, the little frame taking in the full picture projected by means of an instantaneous lens on the ground glass of his camera. Two circles, marked in the exact centers of the front and back surfaces of the combination, serve to enable the operator to bring any certain part of the view to the exact center of the picture by placing the eye so that the two circles cover each other, and at the same time adjusting the camera so that the selected part of the view appears inside the circles.

Figs. 480 and 481 show a new finder which may be used either by reflection or direct vision. There is only one position in which to place the eye for the correct location of the subject upon the plate. The camera should be so held that the cross lines on the two glasses are superposed.

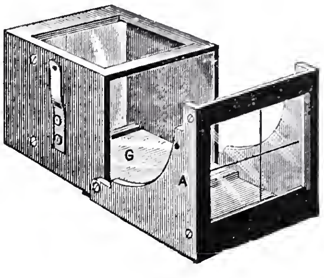


FIG. 480.

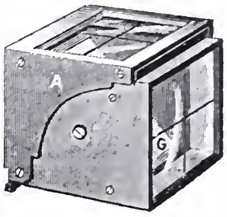


FIG. 481.

VIEW LENS.—See **Lens.**

VIEW METER.—An instrument for readily ascertaining the amount of view that will be depicted upon the ground glass with the lens used. Thus the operator can see the view at a glance without the trouble of setting up and arranging the apparatus. In some view meters the landscape is seen through blue glass, which practically reduces the different colors to monochrome, so that the operator can get a better idea of the actinic powers of the lights and shades of the proposed view.

VIEW MOUNT.—See **Mount.**

VIGNETTING.—A method of positive printing by which the margins of the picture are made to gradually fade away. This softness is produced by many different ways.

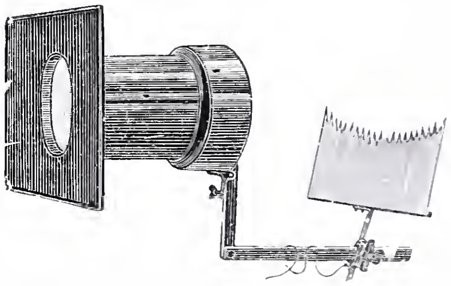


FIG. 482.—ARRANGEMENT FOR VIGNETTING IN THE CAMERA.

The vignette is usually made of cardboard, with a hole cut in it, of a size and shape to suit the requirements of the picture. The edge of the hole is then cut all round with teeth or slits, and then covered over with a piece of thin tissue paper to give softness to the vignetting. This is placed over the negative during the printing operation. An important point is the distance between the negative and the vignetting card. Usually this should be at least about half an inch. The greater the distance, however, the smaller should be the opening. (See Figs. 484 and 485.)

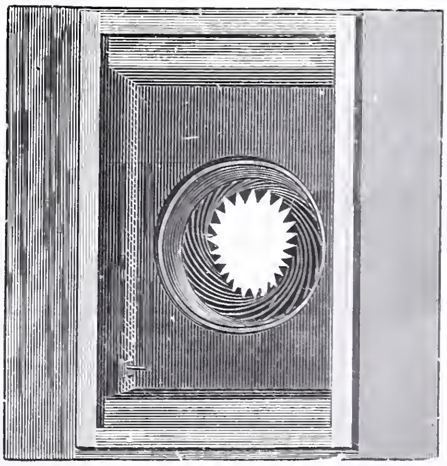


FIG. 483.—MAGIC VIGNETTER.

There are besides this a variety of vignetters, some of glass, with oval or other shaped openings, surrounded by a gradually deepening margin of a non-actinic color; others of zinc with cut-out openings, having serrated edges, and other patent ones, which can be adjusted to any size or shape of opening.

Considerable care and thought are required in producing a successful vignette. They can afterwards, if preferred, be "greyed" by darkening the white margin.

Figs. 482 and 483 show arrangements used for vignetting during the exposure, one being used in front of the lens and the other placed in the interior of the camera.

VINIC ETHER.—See **Ether.**

VIOLET PRINTS.—Cyanotype "blue" prints may be toned to dark violet color by the following method:—

The blue prints are treated with a solution of

Caustic potash	1 part
Water	300 parts

The blue color will be decomposed, and a rusty yellowish-brown substance—ferric hydrate*—will be left on the paper. If then a solution consisting of

Alcohol—90%	25 parts
Water	30 parts
Gallic acid	4 parts

be poured over the rusty color a fine violet black will be the result.

VIRTUAL IMAGE.—See **Image.**

VISION (Lat. *video*—to see).—Lit. the faculty of seeing; that power by which we perceive the forms and color of objects through the sense of sight.

The study of the eye, and the analogy it bears to the photographic camera and lens, is one that is full of interest to the photographic student. The eye is a natural camera obscura lens and diaphragm. It is placed in a bony cavity termed the orbit, and maintained in position by the muscles which serve to move it, by the optic nerve, the conjunctiva, and the eyelids. It is about the same size with most persons, for, although it appears to differ very greatly with many, it is in reality the varying aperture of the eye-lids that makes it appear larger or smaller.

The shape of the eye is that of a spheroid, the curvature of which is greater in the anterior than in the posterior part. It is composed of the following parts:—The *sclerotica*, or white of the eye, which serves for the attachment of the muscles; a transparent medium in front of the eye, through which we see, termed the *cornea*, a tough, velvety membrane, termed the *choroid*, on the inner surface of which is a dark substance preventing internal reflection. The retina is the inmost coat of all, and is composed of layers of nerve-cells, which transmit their impressions to the brain *via* the optic nerve which, communicating directly with the brain, is the immediate seat of vision.* In the center of the iris of the eye is a circular opening called the pupil Behind the pupil and iris is the crystalline lens, a firm and transparent body through which the rays of light pass on their way from the pupil to the retina. It is a single, though not a simple, bi-convex lens, about half-an-inch in diameter, and with a little over half-an-inch focus. The posterior chamber is filled with the vitreous humor, which shapes the whole constructions.

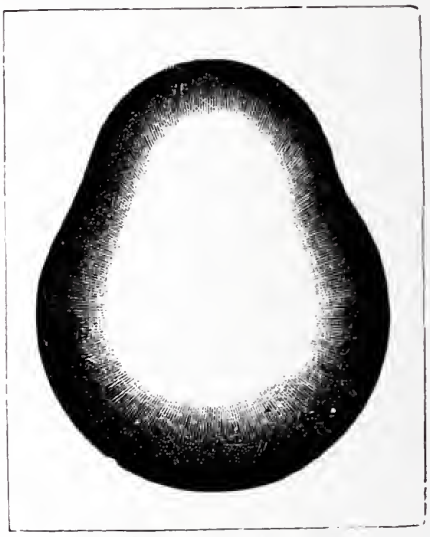


FIG. 484.—PAPER VIGNETTE.

From this description of the structure of the eye its resemblance to the photographic camera will be apparent. The pupil is the aperture, the crystalline the condensing lens, and the retina the screen on which the image is formed.

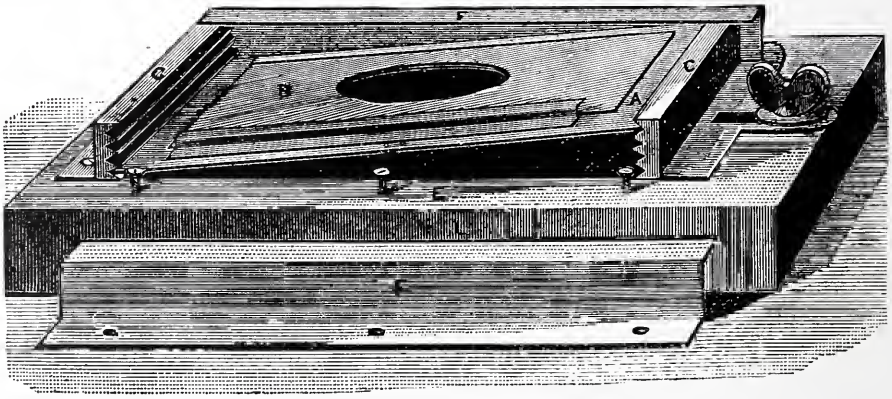


FIG. 485.—MCDONALD'S VIGNETTE.

The image thrown upon the retina is inverted, consequently a natural question arises, Why do we not see objects upside down? The explanation is that "the image simply causes a stimulation of the optic nerve, which produces a change on some part of the brain, and it is only of this change that we are aware, and not of the image itself.

---

* The retina is not simply a dead screen receiving and reflecting the various impressions of light which fall upon it. It is a forest of *living* nerves, which not only distinguish between the intensities and colors of the rays which touch them, but also recognize the direction in which they come. Thus the inversion of the image, as far as the sensation of the retina is concerned, does not exist. If the retina perceives the rays from the summits of objects as coming down to it, and those from the bases as *coming up*, and thus regarding *the object*, and not the (to it) invisible image formed on its own substance, this nerve screen *sees* everything in its proper position. It is a natural error to think of the eye as looking at the image formed on its own retina, but a little thought will show us that such an idea is parallel to the absurdity of hoping to see one's own face without a glass or equivalent reflection. It is then upon the sensitive screen of the retina that the light rays, collected and grouped by the eye lens, make their impression. The nerves of this organ, like those of others, have certain limits to the range of their co-existent perceptions. Thus, just as we cannot hear a whisper in the presence of the rattle of a train, or taste a delicate flavor if mingled with a bitter draught, so we cannot perceive a faint impression of light in presence of another of far greater intensity.—*Prof. Henry Morton.*

The optic angle is the angle formed between the principal optic axes of the two eyes when they are directed toward same object. This angle is, of course, smaller the greater the distance of the object.

The visual angle is the angle under which an object is seen. Taking the same distance, this angle increases with the size of the object, and with the same sized object it decreases as the distance increases. It is therefore evident that objects appear smaller the greater the distance they are from the eye.

A single eye sees most distinctly any point situated in its principal axis, and less distinctly other points towards which it is not directly looking, but which are still within its angle of vision. It is able to judge the direction of any such point, but unable by itself to estimate its distance. Of the distance of an object it may be able to judge by loss of color, decrease in magnitude, indistinct outline, etc.; but if the object be near, the single eye is not infallible with these aids.*

When both our eyes are directed upon one single point we then have a power of judging the distance of that point in comparison with that of any other point, and this power we seem to gain by the sense of the amount of effort required to cause the optical axes to converge upon one point and upon another.

VISITE, CARTE DE.—See **Carte de Viste.**

VISUAL FOCUS.—See **Focus.**

VISUAL RAY —See **Ray.**

VITRIOL.—An old name for all sulphates, as "White," "Blue," or "Green" vitriol. Sulphuric acid being made by decomposing these, was called "Oil of Vitriol," or "Vitriol," *tout court!*

VOLATILE ALKALI..—See **Ammonia.**

VOGEL'S INTENSIFIER.—An uranium intensifier devised by Vogel. It consist of

Uranium nitrate	1 gramme
Red prussiate of potash	1 gramme
Glacial acetic acid	20 grammes
Water	200 grammes

This has a strong intensifying action upon the plate when immersed in it. Local intensification can be accomplished with this solution by applying with a brush. The intensifier can also be removed from the whole or parts only with a dilute solution of ammonia. After intensifying, the plate is washed for about fifteen minutes Longer washing will reduce, the water gradually dissolving the brown substances which affect the intensification

VULCANITE.—A hard, non-elastic variety of vulcanized rubber, used for making a variety of objects, among which may be mentioned dippers, silver baths, photographic dishes, etc. It is not affected by water or any indiarubber solvents

Sheets of polished vulcanite are often used for surfacing gelatine prints. All that is necessary with these is to thoroughly cleanse and squeegee the print firmly to the plate. When dry it will came away with a polished surface slightly inferior to that obtained with a glass plate. The risk of sticking is not so great, however, as with glass., and, further, no special preparation is required.

VULCANIZED RUBBER.—Caoutchouc, or indiarubber, treated with sulphur, to render it insensible to atmospheric changes; more durable and more suitable for a number of purposes.

WARNERKE'S PROCESS.—A simplified collotype process, invented by M. Raymond, of Paris, and introduced in this country by Warnerke. The printing surface employed is vegetable parchment, coated with a suitable gelatine. This is sensitized in a bichromate bath, and then squeegeed on to a talced glass. When dry, it can be stripped from the glass, and is ready for printing from, under a reversed negative, the exposure being prolonged "until the details corresponding with the most opaque parts of the negative are discernible." The time required varies, of course, with the actinicity of the light and the density of the negative. After exposure beneath the negative the parchment is removed, and the back of it exposed a second time for about five minutes in order to more firmly fix the gelatine film to the parchment and to diminish the swelling of the gelatine, and consequently the relief. The next operation is to wash the bichromate from the film in several changes of water; it is then blotted and hung up to dry. The dry film is immersed in water for about half an hour, the superfluous moisture blotted off, and the parchment stretched over a wooden frame. The apparatus for holding the parchment consists of solid wooden board as a base, and a clamping frame. After it is stretched on the frame the wooden block, which is smaller but thicker than the frame, is placed under it, and the frame lowered. The block being thicker raises the parchment, and renders it perfectly and tightly stretched.

"Ganot's Physics."

The gelatine surface is then covered for an hour with a solution of

Water	10 ounces
Glycerine	24 ounces
Ammonia	1 ounce

This renders the gelatine better permeable to moisture, and causes it to repel the printing ink.

After about an hour the glycerine solution remaining on the surface is blotted off with a soft rag dabber, and it is ready for printing from.

A good collotype ink is required ; this is spread evenly over the surface with a glue roller, a sheet of paper laid on it, and this backed with a piece of stout, but fine, felt, and the whole placed under a press. An ordinary letter-copying press answers the purpose. Pressure is applied and removed, and then the paper will be found to have received an impression of the collographic plate. For clean margins, slips of oiled paper or cut-out masks should be laid on the printing surface before the paper is applied. After about three or four dozen impressions have been taken off, the plate is remoistened with a solution of glycerine and water.

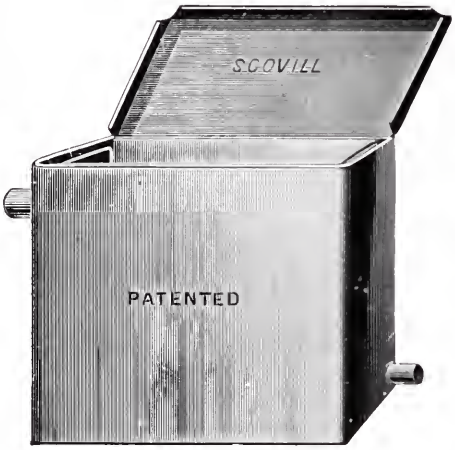


FIG. 486.

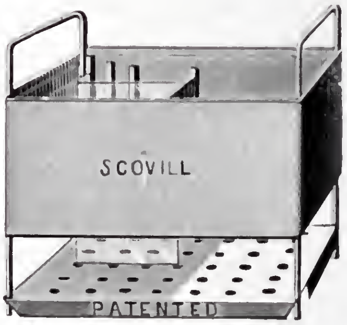


FIG. 487.

WARNERKE'S SENSITOMETER.—See **Sensitometer.**

WASHED EMULSION.—For information regarding the manufacture of washed emulsions, see **Collodion Emulsion (Washed).**

The following formulæ are given in the *British Journal Almanac* :

WASHED EMULSION (for Landscapes).

No. 1.

Ether, s.g. .720	4 fluid ounces
Alcohol, s.g. .820	2¾ fluid ounces
Pyroxyline	40 grains
Castile soap dissolved in alcohol	30 grains
Bromide of ammonium and cadmium	84 grains

Sensitize with one hundred grains of nitrate of silver dissolved in one ounce of boiling alcohol ; and after standing ten days, add a further twenty grains of silver, dissolved as before in two drachms of alcohol.

No. 2 (Rapid).

Ether, s.g. .720	4 fluid ounces
Alcohol, s g. .820	2½ fluid ounces
Pyroxyline	40 grains
Castile soap	30 grains
Bromide of ammonium and cadmium	56 grains

Sensitize with 125 grains of nitrate of silver, dissolved, as before, in one ounce of alcohol with the aid of heat. In twelve hours' time add thirty grains more of the double bromide of ammonium and cadmium dissolved in half an ounce of alcohol.

FOR WASHED EMULSION (for Transparencies).

Ether, s.g. .720	5 fluid ounces
Alcohol, s.g. .820	3 fluid ounces
Pyroxyline or papyroxyline	60 grains
Bromide of cadmium and ammonium	100 grains
or Bromide of zinc	96 grains
Hydrochloric acid, s.g. 1.2	8 minims

Sensitize with twenty grains of nitrate of silver to each ounce, dissolved in a minimum of water with two drachms of boiling alcohol. Allow to stand for two or three days.

N. B.—In the three last formulæ, the emulsion after being allowed to ripen for the time stated, should be poured into a dish and allowed to become thoroughly dry. The mass of dry emulsion is then washed, to remove all the soluble salts, and is then again dried and redissolved in equal parts of ether and alcohol, at the rate of from twenty to twenty-four grains to the ounce of solvents.

WASHING.—The operation of washing the negative and positive prints is performed for the purpose of totally eliminating the sodium hyposulphite and other soluble subtances. Considerable importance is attached to this operation, as upon it depends, to a great extent, the permanency of the negative or positive print.

For negatives, the handiest contrivance is a light wire rack, holding about a dozen negatives, and which can be placed in a suitable zinc or porcelain vessel, through which a running stream of water can be made to flow. With an arrangement of this kind, negatives should be thoroughly washed in about an hour.

In washing prints we have also to prevent them from clinging together. Several arrangements have been contrived and placed upon the market which answer the purpose very well. The water should be emptied quite away several times, the prints drained, and placed in a fresh supply of clean water.

To lessen the time of washing many so called hypo-eliminators have been devised, but with most of these, however, another compound is formed at least as injurious to the permanency of the print as the hypo itself.

Most authors recommend washing the prints in a running stream of water, but a little consideration will show that a number of complete changes will be far more efficacious. We can prove this by experiment. In a large basin of water empty a bottle of strong dye, and allow a stream of water to flow into the basin, and out over the sides. The time taken before the water becomes perfectly colorless will be astonishing. Now, if we simply empty the basin and fill it up again, and repeat this operation but twice, the water will contain no trace of the coloring matter. A similar effect takes place with the hypo, except that the latter being colorless it is not noticeable. The most perfect method of eliminating the hypo from prints is one which, although somewhat tedious and for large numbers of prints hardly possible yet for special work where great permanency is required, might be of great advantage. The prints are washed for a quarter of an hour or so in clean water. Another vessel containing clean water is then arranged near at hand, and each print laid on a sheet of clean glass and squeegeed back and front to remove all possible moisture. It is then placed in the fresh water, and another print treated in the same manner. When all the prints have been subjected to this treatment the water in the first vessel is then changed, and after about another quarter of an hour the prints are again squeegeed and placed in the fresh water. By repeating this operation, say, three or four times, using fresh water each time, the prints should be thoroughly well washed and all traces of hypo eliminated. By this method the length of time the prints are required to remain in the water is considerably lessened, and this is always an advantage, as with a too long immersion in water the albumen has a slight decomposing action which is fatal to permanency.

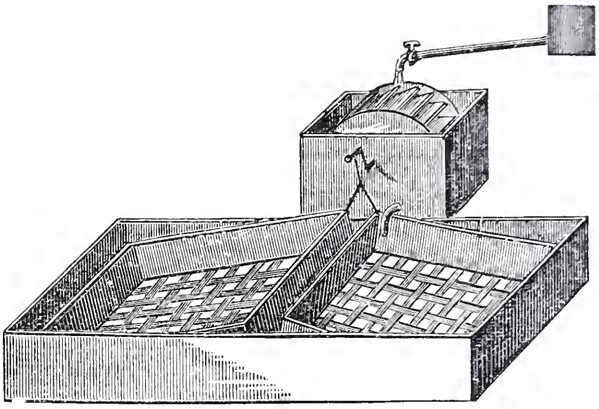


FIG. 488.

Regarding the length of time required in washing to thoroughly eliminate the hypo we cannot do better than give here the excellent experiments of Messrs. Haddon and Grundy, and in their own words: "In carrying out a research on the amounts of silver in hypo left in albumenized paper at different stages of washing, we had two objects in view; firstly, to determine the time the print should be washed; and, secondly, to endeavor to determine the cause of the fading of the finished print.

Three sheets of albumenized paper from the same quire were sensitized on a fifty-grain neutral solution of nitrate of silver and allowed to dry in the dark. These were then cut into pieces 5½ in. × 8½ in. The pieces from one sheet were marked A, from the next B, and from the third C.

The paper thus cut up and marked was washed for ten minutes in running water till all free silver had been removed.

Two of these pieces, taken from different sheets, which could be easily recognized from the letters on the back, were placed on one side, in order to determine the amount of sulphur originally present in the paper and also the amount of silver that had to be removed by the fixing agent.

The remainder of the paper was placed in a pint and a half of a twenty per cent. hypo bath; and as this gave a little more than two ounces of hypo per sheet of paper, we consider we were on the safe side, as Captain Abney says that one ounce of hypo will fix three sheets of paper.

The hypo bath was tested before and after use, and was found to be slightly alkaline to litmus. The temperature was 22.4 deg. C.

The prints were kept in the bath with constant changing for fifteen minutes. Two pieces (again from different sheets) were then taken and allowed to drain for five minutes, and the total sulphur and the remaining silver to be removed by washing determined.

The remaining pieces were then placed in a large vessel filled with water and into which water was constantly flowing. The temperature of the water was 13 deg. C. During the first hour the pieces of paper in the water were constantly turned over in order to prevent them sticking.

Two pieces were removed at the end of 5, 10, 15, 25, 40, 60, 90 and 120 minutes, and 19 hours, and the amounts of silver and sulphur remaining in them determined.

The estimation of the sulphur and silver in the papers was carried out as follows: In each case the two pieces of paper were allowed to drain for five minutes, and then torn up into small pieces and placed in a large beaker, with a mixture of 100 c.c. of nitric acid and 200 c.c of strong hydrochloric acid (free from sulphur), covered with a dark glass, and heated on a sand bath till the paper was completely destroyed. The solution was then taken down to dryness, and 250 c.c. of pure distilled water and three drops of hydrochloric acid added, and the whole heated to boiling, allowed to cool and filtered, and the filter paper and beaker washed with boiling water. The filtrate was heated to boiling and chloride of barium added, which precipitated all the sulphate present as barium sulphate. This was then collected on a filter, dried, and weighed in the usual way, and from this the amount of sulphur present in the paper calculated.

The chloride of silver on the filter was then dissolved out with ammonia, and precipitated by means of nitric acid, filtered off and treated in the usual manner.

The figures obtained are as follows:

1.	Weight of sulphur in original paper	.0050 grammes
2.	" in water adhering to paper	.000032 grammes
3.	" in paper fixed but not washed	.2243 grammes
4.	" after 5 minutes' washing	.0063 grammes
5.	" 10 "	.0045 grammes
6.	" 15 "	.0048 grammes
7.	" 25 "	.0044 grammes
8.	" 40 "	.0043 grammes
9.	" 60 "	.0046 grammes
10.	" 90 "	.0047 grammes
11.	" 120 "	.0045 grammes
12.	" 19 hours' "	.0047 grammes

The amount of sulphur in original paper has been subtracted from results 4 to 12 inclusive.

1.	Weight of silver in paper unfixed	.0734 grammes
2.	" " fixed but not washed	.0086 grammes
3.	" " after 5 minutes' washing	.0051 grammes
4.	" " 10 "	.0035 grammes
5.	" " 15 "	.0037 grammes
6.	" " 25 "	.0037 grammes
7.	" " 40 "	.0033 grammes
8.	" " 60 "	.0036 grammes
9.	" " 90 "	.0038 grammes
10.	" " 120 "	.0040 grammes
11.	" " 19 hours' "	.0039 grammes

From these figures it will be seen that after five minutes' washing 97.2 per cent. of the sulphur originally present has been removed, after ten minutes 98 per cent., and that, however long-continued the washing, no more of the sulphur can be eliminated. Turning to the silver, we find that as the paper comes from the fixing bath it has lost 88.3 per cent. of its silver; after washing for five minutes, 93.1 per cent.; and after ten minutes, 95.3 per cent. After ten minutes' washing the amounts of silver and sulphur remain constant.

It is evident from these figures that the permanency of a print does not depend so much on the washing it receives as on its thorough fixing; and we are strongly of opinion that the best way of removing all the silver is not by using two baths of hypo in succession, but by washing for about five minutes after the first bath, and then soaking in a second fresh bath of hypo.

In what form the silver occurs in the paper, whether as the insoluble $AgNaS_2O_3$ or the soluble $Ag_2Na_3S_2O_3$, held in a sort of a "loose combination" with the films of the paper, we are unable to state. However, the fact remains that, after a more thorough washing and fixing than prints generally get, .246 of a grain of silver remains in each 22 x 17 in. sheet of paper, and this, which is probably in the form of hyposulphite in the presence of light and organic matter, is reduced to silver sulphide, and will easily account for the yellowing of the whites of prints after a time."

In order to test whether the hypo has been thoroughly eliminated from the prints, several methods have been devised. The simplest is the permanganate test. In a pint of distilled water one grain of permanganate and ten grains of potassium carbonate are dissolved. This will give a pink solution. A little of the water in which the prints have been last soaking is now poured into a clean white glass bottle, and to it is added four or five drops of the permanganate solution.

If the water be quite pure the addition of the solution will give it a faint pink tinge, but if any trace of sodium hyposulphite be present this color will be of a light green. After the addition of the permanganate solution the bottle should be well shaken, allowed to stand for about ten minutes or so, and then carefully examined against a white surface.

Another method commonly employed is that known as the "starch iodide test." A small piece of starch, about the size of a pea, is boiled in a quarter of an ounce of water until a clear solution is obtained. To this is then added one drop of tincture of iodine (iodine dissolved in alcohol), which will give it a dark blue color. Two test tubes are now required. Into one is poured some of the last washing water to be tested, and into the other some plain distilled water. One drop of the test solution is now added to each tube, and both well shaken. The next point is to examine the two tubes side by side in front of a piece of white paper. Hypo will cause the blue color to disappear, so that if the washing water does not present as blue an appearance as the other tube containing the distilled water only, it may be decided that hypo is still present.

Dr. Bannon recommended* silver nitrate as a very delicate test for hyposulphite of soda. A print should be removed from the washing apparatus, and the water drained from it into a test tube. This is then heated, and a few drops of a silver nitrate solution added to it. It is stated that even if so small a quantity as the one ten-thousandth part of hypo be present a black precipitate will be formed, while a smaller amount will produce a precipitate of a yellow color.

WASTE.—All waste material, papers, solutions, etc., containing gold, silver or platinum should be saved for the extraction of the precious metals. See **Residues.**

WATCH CAMERA.—A small camera which when closed has the appearance of an ordinary watch. On pressing a spring a series of about half-a-dozen tubes shoot out into position, and the camera is formed. See fig. 489.

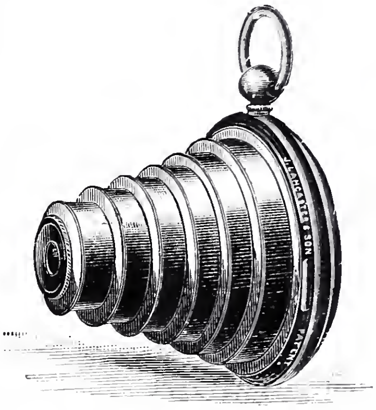


FIG. 489.

WATER (Formula, OH_2).—A clear colorless liquid devoid of taste and smell and possessing a neutral reaction. Pure water is tasteless and colorless, except in thick layers. It boils at 100 C. (212 Fahr.), and becomes solid at 0 C. (32 Fahr.) It is undoubtedly one of the most important substances in nature; it is also the most widely distributed, occurring in three physical states, *i.e.*, liquid, gaseous and solid. In its liquid state it forms the oceans, rivers, lakes, which occupy nearly three-fourths of the whole surface of the earth. In its solid state it forms ice and snow, existing permanently at the polar regions, and, as a vapor, is an important constituent of the aerial envelope of the earth.

Pure water is not found in nature, owing to the fact that it dissolves a portion of whatever it comes in contact with. Rain is the purest form of natural water, but contains certain gases, which it collects from the atmosphere during its descent to the earth.

Water taken from wells, springs, rivers, lakes, etc., differs very much, according to the nature of the earth or rocks over which it passes, or upon which it lies. Among the various substances found dissolved in water taken from different places may be mentioned the following:† Sodium sulphate, sodium chloride, magnesium sulphate, magnesium chloride, magnesium carbonate, calcium sulphate, calcium carbonate, sulphuretted hydrogen, potassium sulphate, potassium chloride; phosphates, bromides and iodides of calcium, aluminum, sulphate, ferrous carbonate, carbonic acid, silica, and a large variety of vegetable substances.

Water from natural sources is commonly classified as *hard* and *soft*, terms which are applied to it according to the manner in which it acts upon soap. If, for instance, we rub a piece of soap in "soft" water, such as ordinary rain water, it is not a difficult matter to speedily produce a lather, and its cleansing powers are easily made use of; but if on the other hand, the water is what is termed "hard," spring water for instance, it will be found that the soap requires a much longer time and considerably more friction to produce the required lather. Curdy flakes will also make their appearance. The reason of this is that soap is formed by the combination of a fatty acid, with an alkali manufactured by boiling oils and fatty substances, with potash for soft soap, and with soda for hard soaps. The action of the soda is to rob from the oil or fat two acids, stearic and oleic acid, and with which it unites to form hard soap, which would be chemically termed a mixture of stearate and oleate of sodium. If we take some soapy water and add a little magnesium sulphate (Epsom salts) solution to it, curdy flakes will be produced in just the same manner as when soap is rubbed in hard water, the soap losing its properties of frothing. The magnesium sulphate has decomposed the soap, forming sodium sulphate, which remains dissolved in the water, and insoluble curdy flakes consisting of stearate and oleate of magnesium. A similar effect is produced by the hard water, the hardness being caused by the presence of different calcium and magnesium salts, all of which have a decomposing action upon the materials contained in the soap. If the hardness be caused by the presence of calcium bicarbonate, it can be got rid of by boiling, as can also most of that due to magnesium bicarbonate. The effect of boiling is to drive away the carbonic anhydride that causes these salts to become soluble, and they will be precipitated.

---

*Photographic Times, 1880.

†Bloxham's "Chemistry."

When spring, river, or well water is boiled in a kettle, a thick fur or incrustation is soon formed in the interior of the vessel. This is usually of a brown color, and the harder the water the more rapid will be the deposit. The explanation is that when natural water is boiled the carbonic acid gas contained in it is expelled, and, as the calcium, magnesium, and iron carbonates are not soluble in water which does not contain carbonic acid, they are precipitated, forming a succession of those layers on the bottom and sides of the vessel in which the water is boiled. This deposit must be removed, and is very annoying in the case of steam boilers, as it is a bad conductor of heat, and in consequence a great waste of fuel is occasioned. A small marble placed in the kettle will lessen the amount of deposit upon the sides. It will be understood that when water is boiled for some time it becomes much softer, owing to the precipitation of the salts. When the hardness can be removed by boiling, it is termed "temporary hardness," but if due to such substances as sulphate of lime, which is not thrown out of solution by boiling, it is termed "permanent hardness."

The organic matter contained in water may be due to several causes. It may be dissolved from the earth, or it may be due to the decomposition of animal or vegetable substances, or from sewage or drainage which has gained access to it.

There are a number of fine analytical tests for the purity of water, used by chemists, which are, however, far too elaborate for the ordinary photographer. The following simple tests may, however, be found useful.

1.—Pour about half a pint of water into a wide-mouth bottle or decanter, close it with the stopper or with the palm of the hand, and shake violently up and down. If an offensive odor is then detected, the water is probably contaminated with sewage gas.

2.—Add to a little water a drop or two of dilute sulphuric acid and enough potassium permanganate (Condy's fluid) to tinge it of a faint rose color, and cover the vessel with a glass plate or a saucer. If the pink tinge be still visible after a quarter of an hour or so, the water is probably good.

3.—Pour a little solution of silver nitrate into a carefully cleaned glass, and see that it remains transparent; then pour in some of the water. Should a strong milkiness appear, which is not cleared up on adding a little dilute nitric acid, the water probably contains much sodium chloride.

The purest form of water is obtained by distillation, that is, by first of all converting the liquid into a vapor, and then recondensing it into the liquid form again. (See **Water, Distilled**).

WATER, DISTILLED.—Pure water obtained by distillation. The water is first filtered, and then distilled in a still (*q.v.*) The water which comes out first should be rejected, as it contains nearly all the volatile impurities; and if one-tenth of the water is allowed to remain in the retort the solid impurities are also left.

Distilled water should give no precipitate with silver nitrate, showing the absence of chlorides; nor with ammonium oxalate, showing the absence of lime; nor with barium chloride, showing the absence of sulpuric acid. A drop of potassium permanganate should give a permanent pink tint to the water, proving the absence of organic matter

WATER DEVELOPING PLATES.—These plates are prepared and sold for the conveniences of amateurs and photographic tourists. No developer is required, as the back of the plate is coated with a medium holding the necessary chemicals for the developer; when the plates are immersed in a dish of clean water, this substance at the back dissolves and forms the developing solution.

WATER GLASS.—See **Sodium Silicate.**

WAX.—A term originally restricted to beeswax, but now extended to various bodies possessing similar characters. Found widely diffused in the vegetable kingdom, occurring as a coating on various parts of plants.

Beeswax is the wax of bees, used by them for constructing their cells. It is a secretion elaborated within the body of the animal from the saccharine matter of honey, and extruded in plates from beneath the rings of the abdomen.

It is a yellow, tough, solid substance, insoluble in water, softening with heat, and becoming liquid below the boiling point of water. It may be bleached by exposure to the air in thin shreds.

It is a mixture of several neutral bodies and fatty acids.

Chinese Wax is a secretion from a tree grown in China.

A solution of wax dissolved in benzole or turpentine is used as an encaustic paste for giving a gloss to silver albumen prints.

THE PHOTOGRAPHIC TIMES.

AN ILLUSTRATED MONTHLY MAGAZINE DEVOTED TO THE ART, SCIENCE AND ADVANCEMENT OF PHOTOGRAPHY.

Issued on the fifteenth of each month.

EDITED BY WALTER E. WOODBURY, F. R. P. S.

SUBSCRIPTION RATES.

For one year,	$4 00	Three months' trial,	$1 00
For six months,	2 00	Single copy,	35

On Foreign Subscriptions, $1.00 is added to pay postage.

Remit by Express Money Order, Draft, P. O. Order, or Registered Letter.

Subscriptions to THE PHOTOGRAPHIC TIMES received by all dealers in photographic materials in this and foreign countries, also by The American News Co. and all its branches.

ADVERTISING RATES WILL BE SENT ON APPLICATION.

Copy for advertisements must be received at office one week in advance of the day of publication. Advertisers receive a copy of the journal free, to certify the correctness of the insertion.

All literary contributions, correspondence, "Queries," etc., should be addressed to THE EDITOR; all advertising matter to the Advertising Manager.

THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION.
60 and 62 East 11th Street, New York.

Businesses For Sale.

Advertisements will be inserted in this column at the rate of 25 cents per line of ten words. Display lines will be charged double. No Advertisement will be inserted for less than one dollar. Cash must in every case accompany copy, which should reach us not later than the tenth of each month.

FOR SALE.—A casket of original Morrison Wide-Angle Lenses, made by the late R. Morrison. Five combinations. These lenses are in perfect condition, exactly as good as new, never having been used more than two or three times. They are in a handsome leather casket, as originally supplied by the manufacturer. These combination sets are no longer made. Original cost $125.00. Will sell for $75.00 to close an estate. Address: EXECUTOR, care of THE PHOTOGRAPHIC TIMES.

FOR SALE.—A first-class, well located, well equipped, and finely lighted gallery. Steam heat, gas or electric light, city water, rent very reasonable. Cabinets $4.00 and $5.00. Other business engagements the reason for selling. Address, SANDERSON, Photographer, Franklin Falls, N. H.

PHOTOGRAPH GALLERY to let at 142 Ferry Street, Newark, N. J. Large focus room newly built, reception room, dressing room, and dark room.
Inquire F. BEYER, 120 Springfield Ave. Rent $20.

FOR SALE —Elegant, modern studio; wealthy city of 25,000, same outside. Unsurpassed location. Elevator, steam heat, ample room. Cabinets $6.00 per dozen. Going out of the business. Paid for itself first year. Sell for $1,000 down; $500 in one year.
Brannock, Norwich, Conn,

Employment.

ADVERTISEMENTS OF OPERATORS SEEKING SITUATIONS WILL BE INSERTED FREE OF CHARGE.

Employment Wanted.

Situation wanted—operator, first class; few equals on composition and lighting; successful with children, retoucher. Remington Rembrandt, General Delivery, Chicago.

A young man of 19 desires a position as assistant printer or general assistant in a photographic studio. Possesses a general knowledge of the art. S. Diamond, 204 E. 32d Street, N. Y.

Situation wanted as retoucher, or reception lady and retoucher. Address A. H. Macdonald, Presque Isle, Me.

Employment wanted by an all-around photographer, position as operator, retoucher, or printer, 13 years experience. Single, 28 years of age. Samples of work furnished if desired. Address, Operator, 928 Bedford Avenue, Pittsburgh, Pa.

Operator and retoucher, experienced in best establishments, is open for engagement at good studio. Salary or percentage of receipts. A. W., Box 6, Stamford, Conn.

Wanted, one copy each Photo Times for January, February, and March, 1898. Address G. H. W., care Photo Times.

Wanted—Position in photo studio; positive retoucher and finishing assistant generally. Address "James," Photographer, Castleton, Vt.

Operator and retoucher of ability open for engagement. M. B., care W. Schreiber, 236 East 10th Street, New York City.

Young man, 19, desires position as assistant photographer. Possesses a general knowledge of the art. S. Diamond, 204 E. 32d. St., N.Y.

Note.—Some interesting reading matter will be found on the following pages.

FREE

EXHIBITION

OF LANDSCAPES.

Persons traveling between New York and Chicago on one of the New York Central's twenty-four hour trains, have an exhibition of landscapes unequaled elsewhere.

First.—There are 142 miles of river and mountain scenery between New York and Albany, including the Catskill Mountains and the ever-varying pictures of the historic Hudson River.

Second.—The Mohawk Valley, which for more than two hundred years has been celebrated in song and story for its exquisite beauty.

A copy of a 48-page folder on the Adirondack Mountain Region, with complete map in colors, will be sent free, postpaid, on receipt of a two-cent stamp, by George H. Daniels, General Passenger Agent, Grand Central Station, New York.

JOHN BRADLEY,

...MANUFACTURING CHEMIST...

SOLE MAKER

OF

PROFESSIONAL PLATINUM

...PAPER...

THE PAPER ON WHICH MASTERPIECES ARE MADE,

Representing the highest standard of Photographic Art.

Developer, Small Size, - .15
" Large " - .35

Mailed free on Receipt of Price.

Special Price per Gross on Application.

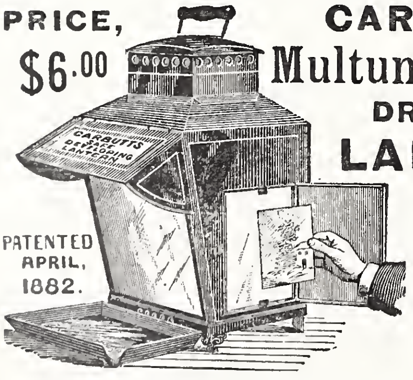
Price List of Printing for the asking

SIZE.	J. Smooth Per Doz.	B. Rough Per Doz.
3¼ x 4¼	$ .25	$ .25
4 x 5	.35	.40
4¼ x 6½	.50	.55
5 x 7	.55	.65
5 x 8	.70	.80
6½ x 8½	.95	1.10
8 x 10	1.45	1.60
10 x 12	2.20	2 50
11 x 14	3 00	3.45
14 x 17	4.75	5.50
16 x 20	0.60	6.25
20 x 26	8.00	9.00

J. BRADLEY, { THE ARTISTS ASSOCIATION,
47 N. Thirteenth St., Phila., Pa.

PRICE,
$6.00

CARBUTT'S
Multum-in-Parvo
DRY PLATE
LANTERN.


CARBUTT'S DRY PLATE DEVELOPING LANTERN

PATENTED
APRIL,
1882.

Lantern arranged for developing, and, after fixing, examining negatives and positives by opal light.

The **Best** and **Cheapest** for all Dark-Room Work.

Manufactured by

JOHN CARBUTT
Wayne Junction,
Philadelphia.

St. LOUIS OFFICE, 2005 Lucas Place. NEW YORK OFFICE, 57 East 9th St.

TRADE MARK COPYRIGHT SECURED

M. A. SEED DRY PLATE COMPANY.

ARROW BRAND

WORKS AT WOODLAND, MO.

TO AMATEUR PHOTOGRAPHERS!

TRY THE NEW GOODS!!

SEED'S G. B. P. R. Lantern Slides, and . . . . .
Transparency Plates . . . .

Six different tones produced by development. **Seed's Positive Films,** with **Glossy, Matt,** and **Canvas finish** surface. **Seed's Prepared Dry Developers** in glass tubes and papers. Send for lists and copy of Seed's Manual. Order through any dealer in Photo Goods.

M. A. SEED DRY PLATE CO.

MORAN'S NEW BARGAIN LIST
No. 48,

READY MARCH 1st.

If you want anything in the Photographic line, it will pay you to send for it.

FREE USE OF DARK ROOM.

R. H. MORAN, 22 East 16th St., New York.

One Door West of Union Square.

P. P. P.

PROFESSIONAL PLATINUM PAPER

(Bradley Process)

A new black permanent low-priced Platinum Paper.
Try it and you will use no other.

SOLD BY ALL DEALERS

WILLIAMS, BROWN & EARLE, SOLE AGENTS

PHILADELPHIA.

LANTERN SLIDES.

MADE FROM NEGATIVES, PICTURES, DRAWINGS, ETC.

H. H. WILLIAMS, Charlottesville, Va.

SPECIAL NOTICE.

BACKGROUNDS

FOR CARBON AND

PLATINUM EFFECTS.

W. F. ASHE, Scenic Artist,

76 East 9th Street, - - New York City.

MINOTT M. GOVAN,

Dealer in Photographic Supplies,

No. 5 Clinton Place, New York.

(Three doors from Broadway.)

Fully Illustrated Catalogue and Price List mailed on application. Lenses and Outfits a specialty.

DIETZ RUBY LAMP

For Dark-Room Use.

New Construction

Don't Leak Light.

1½x3x6½ ins.

NO SMOKE.

Sold by Dealers.

We send you one, prepaid, for

75 CENTS.

Circular free.

R. E. DIETZ CO., N. Y.

"Modern and Progressive." Stephen B. Butts. John F. Adams.

BUTTS & ADAMS,

TRADE B & A MARK

Photographic Supplies,

457 and 459 Washington Street,

BUFFALO, N. Y.

CLEMONS' ARROWROOT Salted PAPER

At last I have succeeded in suspending Arrowroot in solution by combining it chemically with another substance as a filler, that each sheet as it comes from the solution, carries with it an even heavy coating of the combined substance, that cannot be obtained by the old mode of applying of Matt surfacing, which I now have discarded, and each sheet will be stamped with a steel stamp . . . . .

"Clemons' Arrowroot Paper."

This paper gives much better Blacks and whites than any other make of paper put on the market.

I have discarded altogether the make of matt salted surface paper. A single trial will convince any one that it will make much the best prints of any plain paper made.

Made by

JOHN R. CLEMONS,

For Sale By

THE SCOVILL & ADAMS CO. OF N. Y.

60 and 62 East 11th Street.

Sample Sheets, 12 cents by mail.

IN A CLASS ALONE.

Columbia

Bevel-Gear

Chainless Bicycle.

Its running qualities are perfect.

OUR CHAIN WHEELS.

Columbias, Hartfords and other Models at low prices.

Catalogue Free.

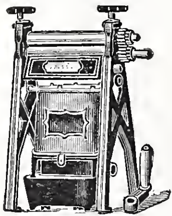
POPE MFG. CO., Hartford, Conn.

Combined Platinum Solution.

A toning agent giving the beautiful platinum tones without preliminary gold toning, combining in one bath the action of the gold and platinum baths.

$1.00 per bottle. ***Amateur size, 50 cents.***

The Scovill & Adams Co of N. Y. 60 & 62 E. 11th St. N. Y.



BURNISHERS

THE MODEL DUPLEX.

6 in., $ 7.50 8 in., $10

10 in., 12.50 12 in., 15

Every amateur should have one. Complete catalogue of Photo Goods, Tripods, Developers, Dry Plates, Cameras, Papers, Etc., free.

JAS. H. SMITH & CO.

311 Wabash Av., Chicago

Dealers supplied at manufacturers' prices.

KING OF FLASH LIGHT POWDERS.

LUXO

PATENTED.

FOR SALE BY ALL DEALERS

W. P. BUCHANAN. PHILADELPHIA.

The "Queen"

Have you seen it ?

Send at once for description and list to

STONE BROS., POTSDAM, N. Y.

If you are not already using

STANDARD PLATES,

give them a trial.

They are the Standard

For Studio and Hand Camera Work.

Standard Dry Plate Co., Mfrs.,

Lewiston, Maine.

ORDER THROUGH YOUR DEALER.

New York Office,
293 Mercer Street, N. Y.

Western Office,
35 to 37 Randolph Street,
Chicago, Ills.

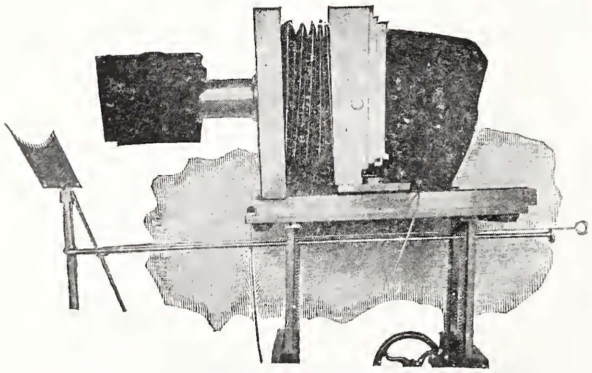
Central and Southern
Office, 708 Arch Street,
Philadelphia, Pa.

Drop us a line and receive our "Booklet on Negative Making."

Try our new "Standard Developer," put up in glass tubes.

The Scovill Vignetter has no Equal.

Acme of Perfection Reached.



PRICE $10.00.

It is worth that much. When you see it, you will agree with us.

It is a nicely nickeled apparatus, perfection of mechanism, an ornament, and decidedly up-to-date, gives your camera an appearance of business.

The only Vignetter worked from back of Camera, having all the movements necessary for making any kind of a Vignette, without the use of STRINGS OR WIRE,

It can be used to great advantage in producing rich effects on light draperies, vignette being placed at top of draperies and rapidly lowered during exposure.

It can be adjusted to any stand and placed at any distance from the lens. The color of Vignette can be ascertained upon the ground glass.

For copying purposes it has no equal. Made in either Black Enamel or Nickel Plates. FOR SALE AT YOUR STOCK DEALER OR

The Scovill & Adams Co. of N. Y.

60 and 62 East 11th St., New York.

PHOTOGRAPHER THIS IS YOUR OPPORTUNITY.

SEND ONE DOLLAR

AND GET BY MAIL

A COMPLETE RETOUCHING OUTFIT IN A LEATHER FOLDING CASE.

KOH-I-NOOR HARDMUTH PENCILS.

The Scovill & Adams Co. of N. Y., 60 and 62 E. 11th St.

A Seasonable Book

For the

Amateur.

"Instantaneous

Photography."

Price, 60 cents.

BARGAIN LIST = = = **No. 10**

Was mailed May 25th.

Bigger than ever!

No. 9 was mailed last October
Did you receive them ?

LENSES,
CAMERAS,
BURNISHERS,
STANDS,
BACKGROUNDS,
Etc., Etc.

We buy, sell and exchange Photographic Apparatus of all kinds. We supply any brands of Plates, Paper, Card Stock, etc., at lowest market rates.

RALPH J. GOLSEN,
146 State St., CHICAGO.

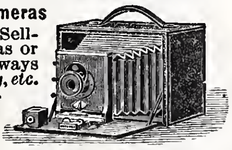
SUBTERRANEAN PHOTOGRAPHY
AND
Interior Work.

GEO. W. HARRIS,
ENGINEER,
92-94 Liberty Street, New York.

N. Y. CAMERA EXCHANGE

60% Saved on all makes of Cameras

Headquarters for Buying, Selling, and Exchanging Cameras or Lenses. Large assortment always on hand. *Developing, printing, etc.* Photo supplies of every description at *lowest prices.* ☞ *Send 2c. stamp for bargain list.* Address
N. Y. CAMERA EXCHANGE, 41 Fulton St., NEW YORK.



Albumen Paper

W. HEUERMANN,
97 & 103 Cedar Street, New York. Room 1005.

PATENTS,

Caveats, Trade-marks, Designs promptly and properly procured in the United States and all foreign countries.

High-class Work. Moderate Fees.
Infringements Suits Conducted.

DAVIS & DAVIS,
(Successors to Alexander & Davis),
Opposite Patent Office. Washington, D. C.
Reference-Editor of Photographic Times.

ALUMINUM
SUN FLASH POWDER
(PATENTED)
WILLIAMS, BROWN & EARLE
PHOTOGRAPHIC SPECIALTIES
PHILADELPHIA
FOR SALE BY ALL DEALERS

ASK TO SEE THE NEW
W. B. & E. ART ALBUMS
NO PASTING REQUIRED
WILLIAMS, BROWN & EARLE
PHOTOGRAPHIC SPECIALTIES
PHILADELPHIA
SOLD BY ALL DEALERS

Always Ready.—A Single Developer that never fails, energetic. Keeps indefinitely. Can be used over and over again until exhausted ; don't stain fingers, brilliant negatives, never appeared in print, great money saver. Cheaper by half than Pyro. Formulae mailed to anyone for $1.00. Address, Evans, No. 9 West Main St., Middletown, N. Y.

Short Stories.

One of the most Entertaining Periodicals Published.

BRIGHT. *SPICY.*

Just the thing for the Traveler and Summer Resorter or the Hearth-Stone in Mid-Winter.

ALWAYS REFRESHING.

Advertisers reap great benefits from it and express unbounded satisfaction at the results of using its columns.

25 Cents a Copy on all News Stands.

Bryant Building, - 55 Liberty Street, - New York.
A Sample Copy Free if Advertisement is mentioned.

Are You Using Hammer Plates?

The Lundelius Magazine Camera, Patented.

For Professionals and Amateurs.

Small, Light, Complete, Always Ready, and under Positive Control.

NO Doors to Open. Slides to Draw.
Plate Holders. Shutters to Set.
Loose Parts. Obstrusive Fixtures.

But only to

Release the Shutter and turn down the Plate.

Operated entirely from the Outside to Focus, Change Plates, Diaphragm, and Speed of Shutter.

Indicator showing the number of unexposed plates.

Made in ***three*** standard sizes, 3¼ x 4¼, 4 x 5, and 5 x 7

Fitted with the following Lenses made by Gundlach Optical Co.:

Turner-Reich Anastigmat,
Instantaneous Symmetrical,
and Single Achromatic

All fitted with Iris Diaphragms.

Carries TWELVE Plates or Cut Films.

Catalogue, Testimonials, and Sample Photos on application.

Manufactured by The Lundelius Camera Co., Incorporated, Port Jervis, N. Y.

For Night Photography

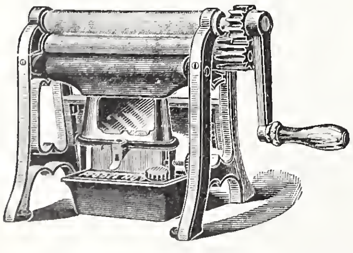
Why?

The Scovill
Magnesium Cartridges
Are the best

Because they give a more actinic light, produce less smoke, and are safer than any other in the market.

THE SCOVILL & ADAMS CO. OF N. Y.
60 and 62 East 11th Street.

JUST OUT **List, $10.00**



8¼ IN. Acme Amateur

Rotary Burnisher.

FULL NICKEL FINISH. ASK YOUR DEALER FOR SAME.

MANUFACTURED BY

Acme Burnisher Company, Fulton, N. Y.

IN ADDITION TO
French Satin Jr.
THE STANDARD BLUE PRINT PAPER

We are Manufacturing a line of

Photographic Specialties

The same careful supervision which controls the manufacture of our Blue Print Paper will be extended to these new products, of which we have ready

MILLEN'S

- NORMAL PHOTOGRAPHIC DEVELOPER
- CHROMIUM FIXING SALT
- STANDARD WHITE PASTE
- HARDENING SOLUTION
- HYDROQUINONE (*Chemically Pure*)

Send for descriptive circulars of any of the above articles

J. C. MILLEN, M. D.,
Manufacturing Chemist,
DENVER, COLORADO: *No. 1731 Welton Street.* .·. .·. U. S. A.

Every Photographer

Can be a

Miniature Painter

by using

Elton's Ground Opal Plates.

Write for particulars to

The Scovill & Adams Co. Of N. Y.

Sole Agents,

60 and 62 East 11th St., N. Y.

PRESERVED IN THE

GILSON ADJUSTABLE ALBUM

are the pride of the owner and the admiration of friends. It is the ***only album*** that will fit collections of all sizes employing from 1 to 48 leaves. It is ***Adjustable, Interchangeable, Expansible, Contractible, Remarkable.***

Prices from 80c. upwards. For sale by dealers generally. ***Send for special catalogue T.***

Use Carter's Mounting Pad

A new invention ***absolutely preventing warping*** and ***cockling*** in mounting. Gloss of squeegee or highly burnished prints undimmed. Simple in construction and easy to use. Ask for descriptive pamphlet. Send 5 cents for 2 ounce tube of

Carter's Photolibrary Paste,

the favorite mountant of amateurs at home and abroad.

THE CARTER'S INK CO.
BOSTON. NEW YORK. CHICAGO.
LONDON. BRUSSELS.

THE FAST MAIL LINE.
Cliffs on the Mississippi.
IRON MOUNTAIN ROUTE

ST·LOUIS TO
ARKANSAS, TEXAS
MEXICO (THE EGYPT OF THE NEW WORLD)
AND
CALIFORNIA.

ELEGANT THROUGH SERVICE VIA THIS
THE TRUE SOUTHERN ROUTE
TO THE
WINTER RESORTS OF THE SOUTHWEST

Write General Passenger Agent for
Pamphlets giving Particulars.

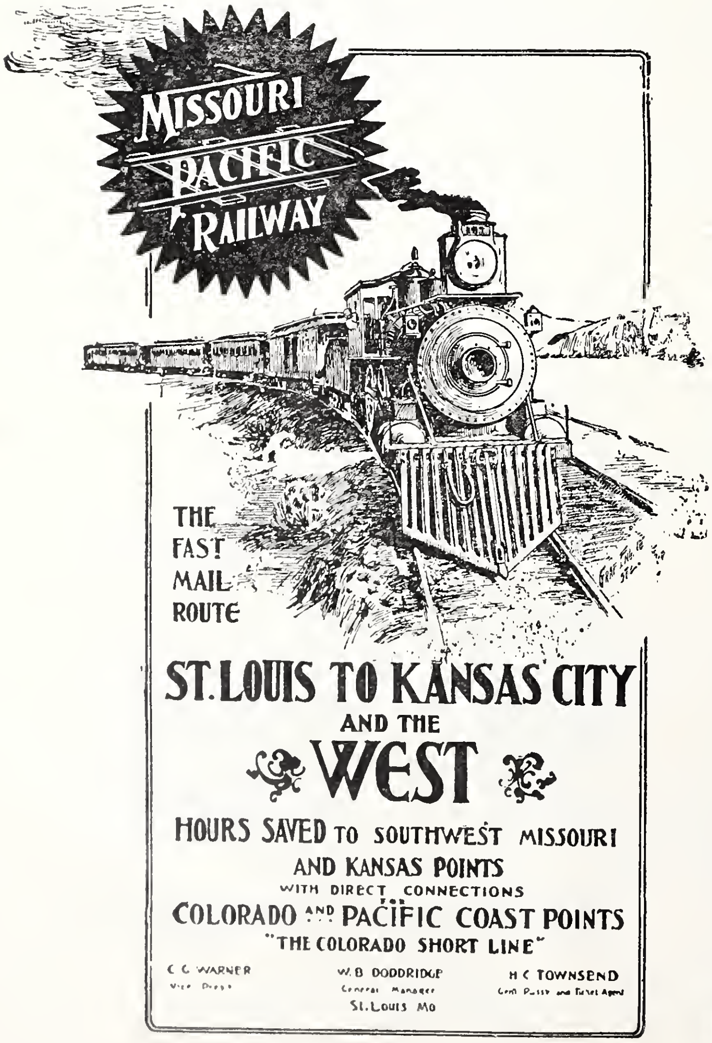
C. G. WARNER, W. B. DODDRIDGE, H. C. TOWNSEND,
·ST·LOUIS·

Now or Never! Stereopticons One-half price!

Owing to the rapid development of our **ACETYLENE GAS** generator business we are **closing out** our Stereopticon Department;—a large stock of electric lamps, magic lanterns, lantern slides and accessories.

Send for "bargain" circular, also information about **ACETYLENE GAS.**

J. B. COLT & CO.
DEPT. H.
3 to 7 West 29th St., New York.



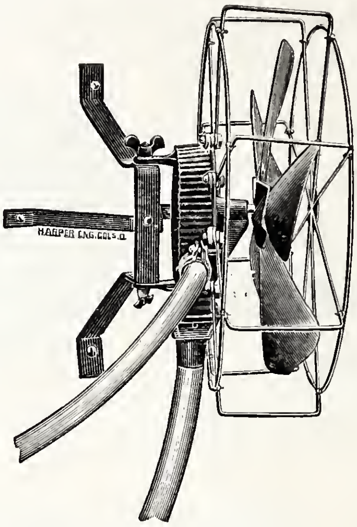
MISSOURI PACIFIC RAILWAY

THE FAST MAIL ROUTE

ST. LOUIS TO KANSAS CITY
AND THE
WEST

HOURS SAVED TO SOUTHWEST MISSOURI
AND KANSAS POINTS
WITH DIRECT CONNECTIONS FOR
COLORADO AND PACIFIC COAST POINTS
"THE COLORADO SHORT LINE"

C. C. WARNER, Vice Pres't
W. B. DODDRIDGE, General Manager
H. C. TOWNSEND, Gen'l Pass'r and Ticket Agent
St. Louis, Mo.


HARPER ENG. COLS. O.

The No Substituting Water Fan.

A Chautauqua Breeze.
No more sweltering in the Dark Room.

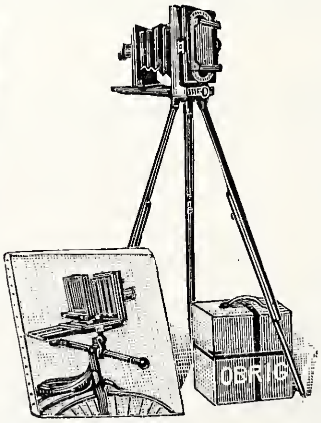
PRICE, $7.50.

Keeps the Dark Room cool.
Dries Negatives in ten minutes.
Operated by Water Pressure—
No Expensive Installation.
Write for descriptive circular.

KIMBALL & MATHEWS, Trade Agents,
Importers and Jobbers of Photographic Material,
32 East Spring Street,
Columbus, O.
For Sale by all Dealers.

OUR FACILITIES

Were NEVER BETTER



For turning out good printing than they are at present. We are known for our good, even and careful work in this respect. With the word "**Printing**" we mean to cover not only **Albumen** and **Aristo** contact work, but **Platinotype** and **Blue Prints** as well. Bromide Enlargements are a specialty with us, and developing both plates and films receive our careful attention and are done at factory prices. Our little "**Booklet of Good Things**" contains prices for all this work, and can be had with our new **Bargain List** (just out) for a one cent stamp.

O. C. Co.'s well known "Special" Blue Paper, 25 cents per yard (cut to any size and mailed free).

OBRIG CAMERA CO.,
165-167 BROADWAY, NEW YORK,
NEAR CORTLANDT STREET.
TELEPHONE No. 4704 CORTLANDT ST.

We have a new KODAK and KODET booklet ready for distribution.

STEINBACH & CO., MALMEDY, GERMANY

Manufacturers of **Photographic Papers**

For Solar and Bromide Enlargements, Salting, Albumenizing, and Baryta Coating;

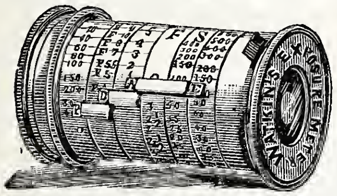
UNEXCELLED FOR BLACK AND BLUE PRINTING,
BARYTA PAPERS, GLOSSY AND MATT SURFACE.

SEND FOR SAMPLES AND ESTIMATES.

NEW YORK OFFICE:
621 BROADWAY.

PAUL PUTTMANN,
Sole Agent for the U. S. and Canada.

AVOID FAILURES IN MAKING NEGATIVES BY USING THE **WATKINS EXPOSURE METERS.**

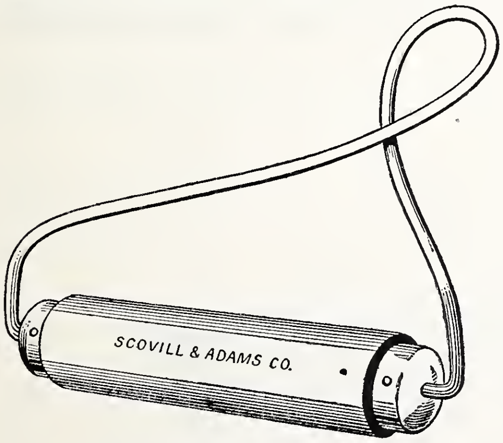


THE NEW STANDARD (1895.) $5.00.

SIMPLER than the old standard, having one less pointer. Provided with the subject and enlarging scales, which do not obtrude themselves when not wanted. The only instrument made which is *absolutely complete* for all problems, especially copying, enlarging and contact printing without reference to tables. It supersedes the old enlarging pattern at a smaller cost. The best all round instrument, as for ordinary work it is quite as simple in use as the Watch or Junior patterns, though not made so light or convenient in shape; quite a feather-weight when made in aluminum. Provided with a pendulum, which is invaluable for timing the actinometer and camera exposures. Exposures under one second are now marked in vulgar fractions, on a distinct part of the scale to the seconds scale.

INSTRUCTIONS (for all ordinary subjects).—*Set pointer P to plate speed, D to the diaphragm, A to the light value, and E will indicate the exposure.*

For Sale by THE SCOVILL & ADAMS CO. OF N. Y., 60 & 62 E. 11th St.



SOMETHING NEW.

The Simplex Print Roller

IS SIMPLE AND CHEAP.

ASK YOUR DEALER FOR ONE.

PRICE, 50 CENTS.

FOR SALE BY ALL THE TRADE, AND

THE SCOVILL & ADAMS CO. OF N. Y., Trade Agents.

Have we reached the limit

of Perfection? Many of our customers who are using our latest creation, **Special Portrait Velox,** think so.

Every professional photographer should try same at once. Be sure to get "Special Portrait Velox": Besides having all the advantages of our other Velox papers it gives effects which heretofore have never been attained.

None is better adapted for High Class Work.

NEPERA CHEMICAL COMPANY

Standard Papers for Photographic Processes.

B. F. K. RIVES

FOR ALBUMENIZING, ARISTOTYPE (GELATINE AND COLLODION), BROMIDE, SOLAR
CHEMICALLY PURE PHOTO BLOTTING PAPER.

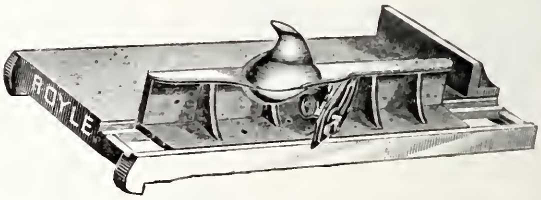
NEW YORK OFFICE:
621 Broadway (Cable Building).

BLANCHET FRÈRES & KLÉBER,
RIVES—ISÈRE. (FRANCE.)

SHOOT BOARDS

We make Shoot-boards in a variety of styles and sizes, for square work and beveling. Our line has recently extended and the various boards and planes brought up to modern requirements. We have square planes for handling the hardest blocking woods and beveling planes suitable for half-tone work.

JOHN ROYLE & SONS,
Paterson, N. J., U. S. A.



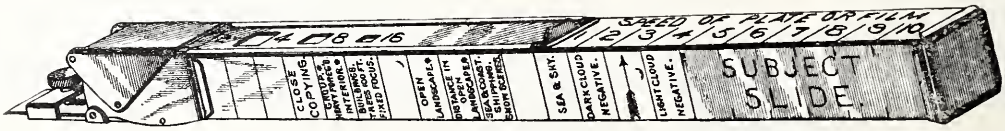
THE SCOVILL MAGNESIUM COMPOUND

IS ENTIRELY FREE FROM POISONOUS AND EXPLOSIVE INGREDIENTS.

In order to demonstrate this, quantities have been eaten at various times. It has often been pounded in a mortar to show that it does not explode.

FOR SALE BY ALL DEALERS.

THE EXPODAK.



(Exact Size.)

Is not a camera, but it can be used with any camera or kodak ever made.

It is a small and handy exposure meter, and tells how in a few seconds the exact exposure required for any subject, with any lens, with any stop, and in any light. Skeptical, are you? Well! we'll convince you

Send us money order for $2.50 and an instrument will be promptly sent to you on the express condition that money will be refunded if you do not want to keep it. Then if you decide not to keep it, all you have to do is to send the instrument back with your name and address, and your money will be promptly and cheerfully returned.

We put this instrument on the market on June 1st, and since then have sent out hundreds of them on the above conditions.

Not one has been returned. This speaks for itself. You cannot afford to be without one if you wish to excel in photography. You will never make a mistake in exposure when using it.

SIMPLE. PRACTICAL. ACCURATE.

For further particulars send us your name and address on a card and our book "Expodakry" (which gives very interesting information to all photographers) will be sent you free,

THE EXPODAK COMPANY, Charlottesville, Va.

DO YOU MAKE SOLAR PRINTS FOR CRAYON WORK . · . ?

If so

Use the Valley Endless Roll Paper.

VALLEY PAPER CO., HOLYOKE, MASS.

The following correspondence explains itself. The Group referred to is a 25 x 30 negative of the National Bankers' Convention, recently held in Detroit. It is composed of 860 faces, all perfectly distinct.

Allen Bro.'s, Sole Agents, Detroit, Mich.

Mr. C. M. Hayes, Detroit, Mich.

St. Louis, Mo., June 7, 1898.

Dear Sir and Brother: To decide a friendly dispute, I take the liberty to ask you with what kind of a lens (and of how long focus) the big Group Picture was made, of which you sent us a copy. Also, if you remember, what exposure did you give?

By complying with my wish, you would much oblige, Yours fraternally,

R. Benecke, Supt. G. Cramer Dry Plate Works.

[Reply.]

Mr. R. Benecke,
Cramer Dry Plate Works, St. Louis, Mo.

Detroit, Mich., June 8, 1898.

Dear Sir: Referring to yours of the 7th, would say that the lens which made the exposure was an 8 A Suter, 72 inch focus. The exposure was two seconds on a 25 x 30 Crown Plate.

Trusting that the information which we have given you is what you desired, we are

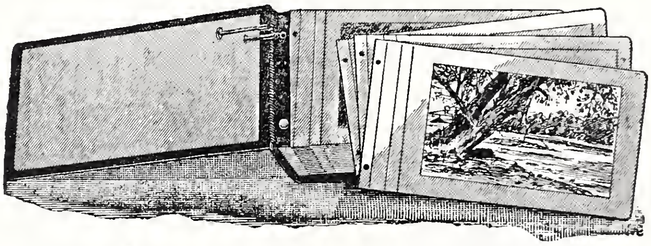
Respectfully yours, C. M. Hayes & Co.

THE REGENT ALBUM.--INTERCHANGEABLE LEAVES.

The Regent Album combines neatness with durability.

The patent interchangeable feature is constructed in such a manner as to allow the leaves to be readily removed and replaced with little or no trouble and in the twinkling of a moment.

The leaves of The Regent Album lie absolutely flat and are perfectly rigid in the back.



PRICE LIST.

Each Album Containing 25 Leaves.

No.	Size	Price	Extra Leaves, White or Gray, per doz.,
No. 1—	6 x 7	$1 25	$0 35
No. 2—	7 x 10	1 50	45
No. 3—	10 x 12	2 00	75
No. 4 -	11 x 14	2 50	1 00

Leaves for Squeegee Photographs.

No.	Size	per doz.,
No. 1—	6 x 7	$0 50
No. 2—	7 x 10	70
No. 3—	10 x 12	1 25
No. 4—	11 x 14	1 55

The Regent Albums are bound in full cloth, handsomely embossed, finished with gilt title, and enclosed in a neat box.

THE LEAVES AND COVERS ARE ROUND CORNERED.

THEY ARE MANUFACTURED AND PATENTED BY FELIX REIFSCHNEIDER.
FOR SALE BY ALL DEALERS AND THE TRADE AGENTS,
THE SCOVILL & ADAMS CO. OF N. Y., - - - - 60 and 62 East 11th St., New York.

THE ACID FIXING AND HARDENING COMPOUND

For NEGATIVES, TRANSPARENCIES, LANTERN-SLIDES and BROMIDE PAPER.

Destroys all developing fog and yields peculiarly beautiful and permanent results.

This solution can be used repeatedly so long as it fixes. It can also be used as a reducer of over density by a long continued treatment.

Price, in one lb. packages, only 25 cts. | In one-half lb. packages, only 15 cts.

FOR SALE BY ALL DEALERS.

PHOTOGRAPHIC GOODS

OF EVERY DESCRIPTION.

SWEET, WALLACH & CO.

215-221 WABASH AVENUE,

CHICAGO.

Largest and Best Assorted Stock in the World

"Some Mounting Paste, please" says Inexperienced, and gets what the salesman pleases.

"Some ***HIGGINS' PHOTO MOUNTER,"*** says Experienced, and gets what pleases **him.** The difference is in the articles, and the moral is—if you want a **good thing** ask for it.

HIGGINS' PHOTO MOUNTER is a beautiful, pure, white adhesive, finely scented. A perfect homogeneous solution in a soft, pasty form, from which the water never separates, as in the common starch or flour pastes. Its beautiful, soft, unctuous consistency, and its wonderful smooth and easy spreading qualities (non fluid at rest but fluid under the movements of the brush) are possessed by no other adhesive, and are of the greatest importance in perfect and easy mounting. Does not strike through nor warp, adheres instantly and powerfully, dries quickly and prevents curling off at the edges. Guaranteed never to change or deteriorate. Unequaled for mounting photographs, textile samples, scrap-books, tissue work, and general use as a substitute for mucilage.

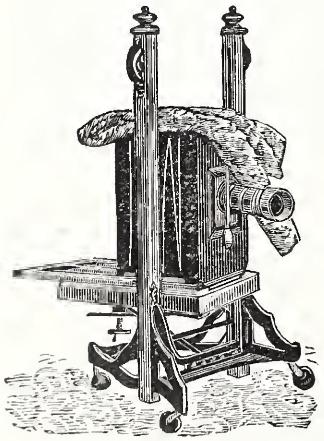
REFUSE ALL IMITATIONS.

FOR SALE BY ALL PHOTO SUPPLY HOUSES.

A 3-ounce jar, prepaid by mail, for thirty cents, or descriptive circulars for nothing, from

CHAS. M. HIGGINS & CO., Sole Manufacturers,

London Office, 106 Charing Cross Road. 168-172 Eighth St., Brooklyn, N. Y., U. S. A.



900

SEMI-CENTENNIAL STANDS

IN

900

PHOTOGRAPHIC STUDIOS

1000

More still contemplating using the only time saving stand

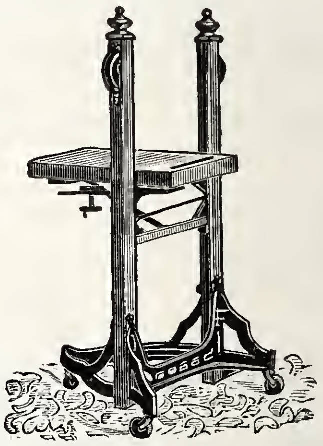
ON THE MARKET.

ALL DEALERS SELL THEM.

HORGAN, ROBEY & CO.

Wholesale and Retail Dealers,

34 Bromfield St., Boston, Mass.



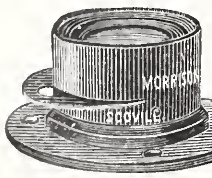
MORRISON WIDE-ANGLE VIEW LENSES.

These lenses are absolutely rectilinear; they embrace an angle of 90 degrees, and are the most rapid *wide-angle* lenses made.

No.	Diameter of Lens.	Size of Plate.		Equivalent Focus.			Price.	
0	..1 inch	...3¼x4¼	inch	... 2¼	inch	...each,	$20.00	These 5 sizes will fit into 1 flange.
2	..1 "	...4 x 5	"	... 3½	"	... "	25.00	
3	..1 "	...4¼x 6½	"	... 4¼	"	... "	25.00	
4	..1 "	...5 x 8	"	... 5¼	"	... "	25.00	
5	..1 "	...6½x 8½	"	.. 6½	"	... "	25.00	
6	..1 "	...8 x10	"	... 8	"	... "	30.00	
7	..1¼ "	...11x14	"	...10½	"	... "	40.00	These 2 sizes will fit into 1 flange.
8	..1¼ "	...14x17	"	...14	"	... "	50.00	

☞ Nos. 1 to 6 are all made in matched pairs for stereoscopic work. The shorter-focused lenses are especially adapted for street and other views in confined situations. For general purposes, a pair of No. 5 lenses will be found most useful.

FOR SALE BY ALL DEALERS.



Diploma and Medal Awarded at the World's Columbian Exposition, 1893.

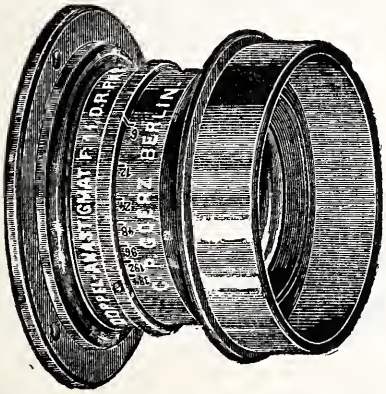
THE ALBERTYPE COMPANY,

15 LAIGHT STREET, NEW YORK,
Near Canal Street, West.

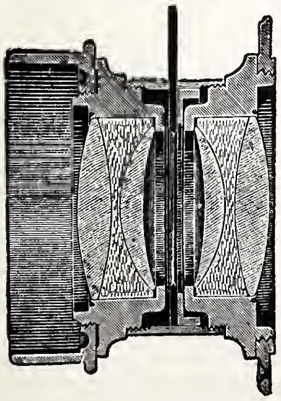
Photogelatine Printing.

THE LARGEST PLANT IN AMERICA.

Specialty: Souvenir Albums, Booklets, Catalogues,
Made to Order from Photographs or Negatives.
(WRITE FOR SAMPLES AND EDITION PRICES.)



German Patent No. 74,437.
American Patent No. 528,155.



TRY THE GOERZ

Double Anastigmat

Before Buying Another Lens.

It will give you better definition, greater depth of focus and more illumination, over the whole of your plate than any other lens on the market.

FOR SALE BY ALL DEALERS OR

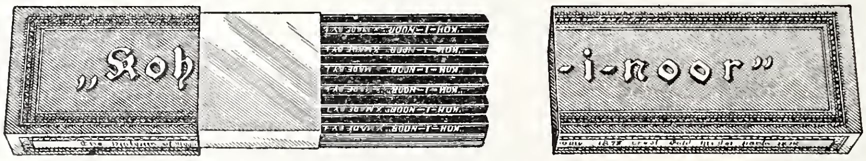
C. P. GOERZ,

52 Union Square East, - - - - NEW YORK.
Factory at Berlin (Germany).

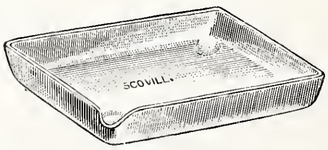
TO OUR PROFESSIONAL FRIEND.

You are Busy and have no Time to Listen to a Man Talking through his Hat. But pause one Moment, We will Show You How to Gain A Leisure Hour In Every Day, Also Increase Your Trade and Revenue. Throw your Old Vignetters All Away USE THE DIXIE and the Deed is Done. When You see It, Neat, Strong and Scientific, You'll be Pleased, And when You find that You Really Can Adjust It to Any Shape and Size Desired, and see What Soft Beautiful Vignettes It Makes, You'll be Delighted. And when You are again Found Without It, You will be Out of the Photographic Business.

HARDTMUTH'S PHOTOGRAPHIC SPECIALTIES.



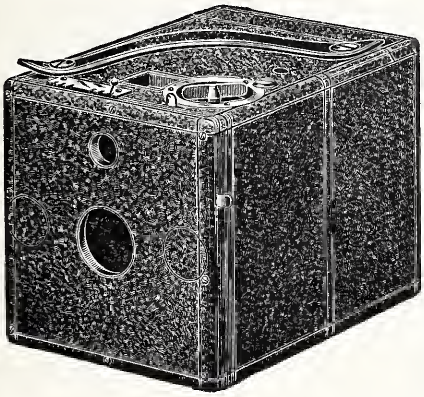
RETOUCHING PENCILS.



PORCELAIN TRAYS.

The Scovill and Adams Company of New York,

60 and 62 East Eleventh Street, New York, U. S. A.



The **Hawk-Eye, Jr.**

for the
Professional
as well as the
Amateur.

Price, $8.

Measures but 4¼ x 4¾ x 6 inches, has a square finder, automatic time register, improved time and instantaneous shutter, with different speeds; loads in broad daylight and can be used with film for 12 or 25 ex. or glass plates.

Send for our catalogue of New Cameras.

THE BLAIR CAMERA CO., Manufacturers, 22 Randolph Street, Boston.

Look out
for
imitations
of

WATERBURY
CARDBOARD.

REDUCED
PRICE LIST.

WITH NEW PRICES.
SEND FOR
A SAMPLE

Look out
for the
genuine, too,
and see
that you
get it.

It is
the Best
and Cheapest.

SELF TONING PAPER.

A Boon To Professional and Amateur Photographers

PERMANENT GOLD TONES WITHOUT A TONING BATH.

From the Printing Frame to the Hypo, and from the Fixing Bath to the Wash Tray. No Intermediate Processes.

Simplicity, Celerity and Durability combined with economy

COPYRIGHTED
SELF-TONING
TRADE MARK

The latest achievement of Photographic Research.

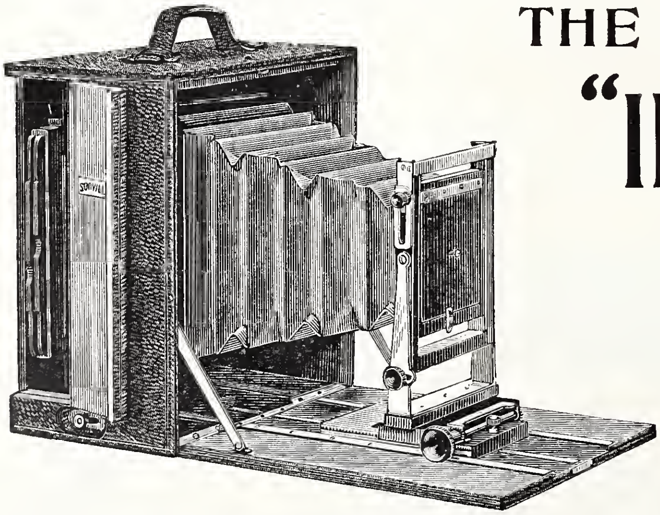
MANUFACTURED BY

AMERICAN SELF TONING PAPER MANUFACTURING COMPANY.

FOR SALE BY

THE SCOVILL & ADAMS CO. OF N. Y.,

60 and 62 East 11th New York.



THE IMPROVED

"IRVING-CLAY"

CAMERA

THIS "fin de siècle" Camera, as it has been called, marks the highest attainment in camera manufacture *at the end of this century*. It is made at the works of the well-known American Optical Company, which in itself is a guarantee of perfection in durability of construction and fineness of finish.

A preliminary camera of this name was introduced some weeks ago, and the entire stock was quickly sold. The **Improved Irving-Clay** fully justifies its name as it is a much improved form of the first camera of this class introduced. It contains two double holders instead of one, and the entire construction of the camera has been improved, with many useful and valuable features added.

The Improved Irving-Clay combines the best features of the well-known "Henry Clay" and "Irving" Cameras, as its name indicates, and is the only hand and tripod folding camera with reversible self-adjusting spring back, and other features characteristic of these two cameras. It is made of thin spruce, highly polished, and is therefore extremely light and portable. It is covered with the best grade of leather, and possesses all the movements—swing back, front focus, shifting front and movable front boards—and conveniences which an "up-to-date" camera should have.

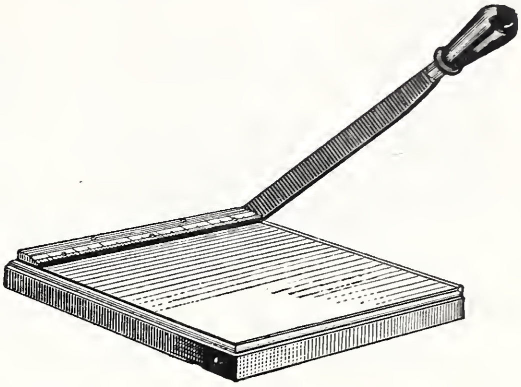
PRICE:	6½ x 8½, with *two* Double Irving-Clay Plate Holders,	**$45.00**
	8 x 10, " " " " "	**50,00**

The Scovill & Adams Company of New York,

60 and 62 EAST 11th STREET, NEW YORK.

Simplex Print Trimmer.

* * *



Cheaper than any other.

Better than all the others.

* * *

In the manufacture of this Trimmer we have given special attention to the knives, with the result that they are more evenly tempered, and better adjusted than those costing double.

COMPARE OUR PRICES WITH ALL THE OTHERS.

No. 0. 7 inch blade	*$2 00.*
No. 1. 8½ inch blade	*2 25.*
No. 2. 10 inch blade	*2 50.*

Discount to the trade upon application to

THE SCOVILL & ADAMS CO. OF NEW YORK,

60 and 62 East 11th Street.

A NEW BARGAIN LIST

"chock full to running over" with good things, and a genuine money saver,

IS NOW READY FOR DISTRIBUTION.

IF YOU WANT ONE, take a Postal Card, write your name and address and the words **Bargain List** on it, then mail it to us.

Please bear in mind this fact—Our Business is Photographic Supplies and that we make Photographic Supplies our Business.

We don't sell Shoes or Plows.

We want your orders for

LENSES, CAMERAS, BACKGROUNDS,

Etc., Etc., and promise your orders prompt attention.

WE MAKE

Leigh's Combination Photo Printing Frame,
California Automatic Print Washer,
Peck's Pneumatic Retoucher,
and other useful specialties.

WE ARE AGENTS FOR

Klay Multiplying Plate Holder,
Somerville's Celebrated Lenses,
Dixie Vignetters.

WRITE FOR CATALOGUES.

H. A. HYATT,
410 and 412 North Broadway,
ST. LOUIS, MO.

The "SIMPLEX"

Printing Frame

Light, Compact,
Simple, Durable
and Inexpensive.

The Frame is made of Japanned Iron, with Wooden Back, covered with Billiard Cloth.

IT SELLS ON SIGHT!

Prices as follows:

3¼ x 4¼, 3½ x 3½,	24c.
4 x 5,	25c.
5 x 7,	32c.
5 x 8,	35c.

For Sale by all Dealers, and....

The Scovill & Adams Co. of N. Y.,

60 & 62 East 11th Street, NEW YORK.

THE WATERBURY ALBUM

Is the latest thing on the market in the way of an Interchangeable Leaf Album.

Embossed Black
Cloth Covers,
White Leaves.

NOTE THE LIST PRICE.

7 x 10,	10 x 12,	11 x 14,
$1.10	$1.60	$2.00

THE SCOVILL & ADAMS CO. OF NEW YORK,
60 and 62 East 11th Street, New York City.

THE TURNER-REICH

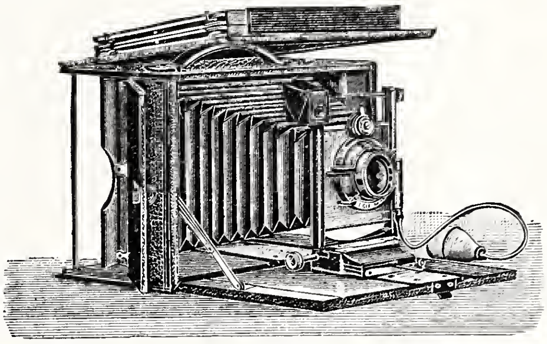
Anastigmat Lens

Is unsurpassed by any other in the market.
It has an aperture of F: 7.5.

*Marvellous Depth of Focus and
An Absolutely Flat Field.*

Prices Lower than those of any other Anastigmat Lens.

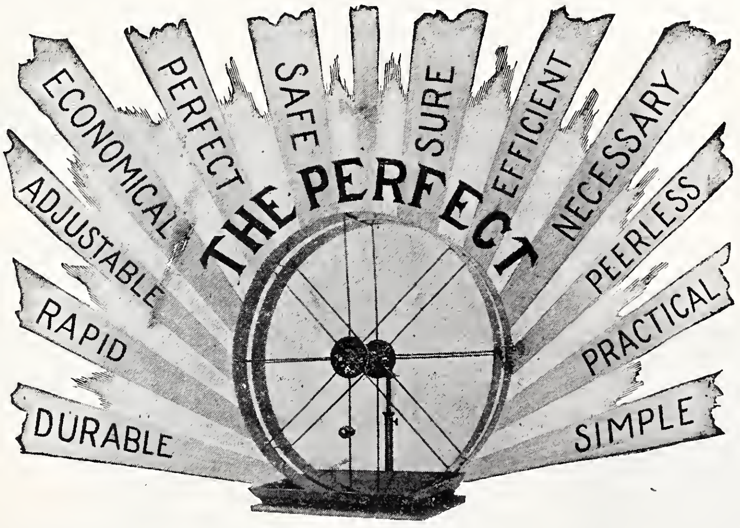
OUR LENSES ARE WORLD RENOWNED.
OUR SHUTTERS LEAD
OUR CAMERAS ARE UNSURPASSED IN WORKMANSHIP OR FINISH.



The only concern in the United States turning out a complete camera, lens, and shutter, all of their own manufacture.

Send for Catalogue.

GUNDLACH OPTICAL COMPANY, 751 to 765 South Clinton Street, Rochester, N. Y.



PATENT PENDING.

DEVELOP YOUR OWN FILMS.

The "Perfect" Rotary Film Developer.

Price $2.50. For Sale by all Dealers in Photographic Supplies.

THE SCOVILL & ADAMS CO. OF N. Y.

60 and 62 East 11th Street, New York.

THE BRILLIANT DEVELOPER.

This new developer surpasses all others in **covering power** and **cheapness,** it keeps for weeks after use, and a surprising number of plates can be developed in the same solution before it is exhausted. With equal exposures and equal time of development it will give as an average **three times** more **covering** than any other developer. It is a liquid developer and ready for use after being mixed with an equal quantity of a 10 per cent. solution of Carbonate of Potash. It is very clean and discolors very little even when kept some time after use.

After extensive tests, comparing it with Pyro, Ferro Oxalate, Hydrochinone, Metol, Eikonogen, Amidol, etc., etc., it has been ascertained, that in using the Brilliant Developer as an average only **one third** of the time of **exposure** is necessary, compared with the exposure required when developing with the other developers, which is an enormous advantage, especially during dull weather. Thus much money, time, and work can be saved on plates, which otherwise would have been **lost** by **under exposure** or the object having **moved.**

The price is very moderate and lower than of the most developers at present in use, as the same solution can be used over and over again by adding from time to time some fresh Brilliant Developer.

The success this new developer is having in Europe is simply marvellous, especially with professional Photographers, who are as a rule, so reluctant to try new materials. It has obtained a prize at the **Berlin Exhibition for Photography,** and scores of testimonials are arriving every week.

FORMULA.

Dissolve 1 oz. of Pure Carbonate of Potash in 10 ozs. of water.
Mix 1 oz. of Brilliant Developer with 1 oz. of the above Potash solution.

If very soft negatives are required the proportion of potash solution may be increased.

FOR DEVELOPMENT OF BROMIDE PAPER,

for which the Brilliant Developer is also particularly suitable the following proportions are recommended:

½ oz. of Brilliant Developer.
½ " " Potash Solution.
1 " " Water.

This will develop a great number of Prints. For softer results more water must be added.

THE BARMEN DRY PLATES MF$^{\underline{\text{Y}}}$.

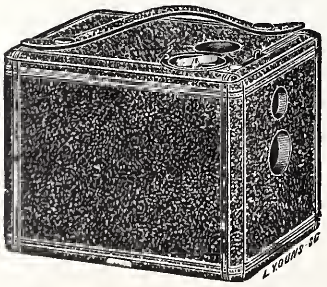
BRUNE & HÖFINGHOFF,

TRADE AGENTS:

THE SCOVILL & ADAMS CO. OF NEW YORK,
60 and 62 East Eleventh Street, NEW YORK.

BUCKEYE Cameras

TRADE MARK



BUCKEYE

Special Plates or Cartridges.

"New American" Film Cartridges

...FOR...

BUCKEYES,
BULLSEYES,
BULLETS,
KODAKS AND
HAWKEYES.

MANUFACTURED BY

The American Camera Manufacturing Co.,

NORTHBOROUGH, MASS.
U. S. A.

For Sale by
THE SCOVILL & ADAMS CO. OF N. Y.

PHOTOGRAPHIC·MATERIALS·AND·SUPPLIES·
W. C. CULLEN
No. 61·WILLIAM·ST·NEW·YORK

SPECIAL NOTICE.

P. P. P.

PAGET PRIZE PLATES for Lantern Slides.

UNEXCELLED FOR QUALITY AND BRILLIANCY OF TONE.
HIGHLY SPOKEN OF BY THE PRIZE WINNERS.

Read what they say:

New York Camera Club,
Mr. W. C. Cullen : New York, March 30, 1896.

Dear Sir:—In answer to your inquiry, would say, I consider the Paget Lantern Slide Plate as without a rival. It is the only plate within my knowledge on which a variety of pleasing tones, running through the blacks, browns, purples and reds, can be produced at will, by *development* alone. Yours truly,

Wm. A. Fraser.

Society of Amateur Photographers of N. Y.,
March 26, 1896.

Mr. W. C. Cullen :

Dear Sir:—The Paget Lantern Slide Plates are superior to anything I have used. The majority of my prize slides were made with them.

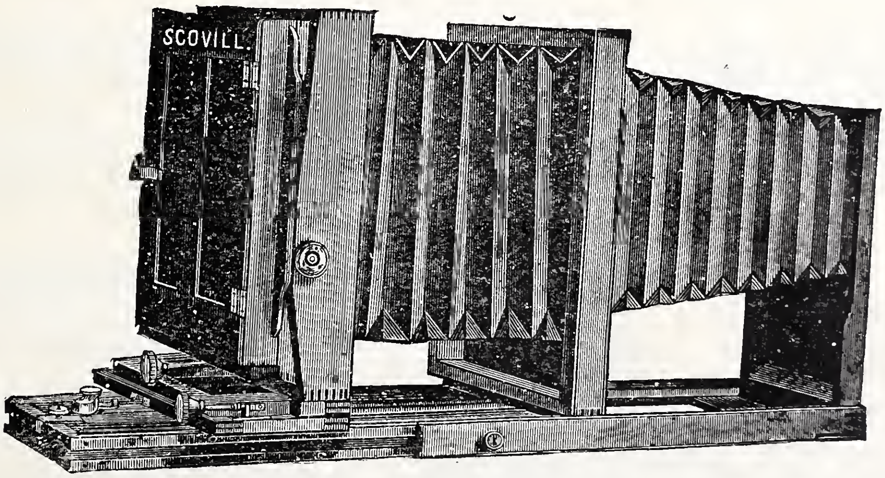
Very truly,

W. B. Post.

W. C. CULLEN, Sole Agent for U. S.,
61 WILLIAM STREET, NEW YORK.

THE SCOVILL & ADAMS COMPANY'S

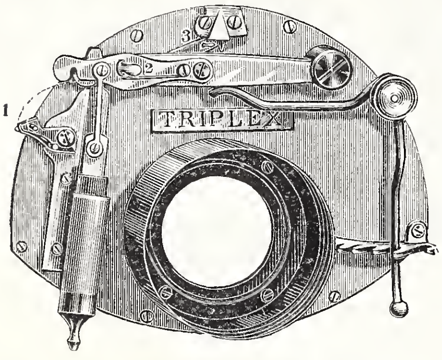
UNRIVALED PORTRAIT CAMERAS.



The American Optical Company Portrait Cameras are manufactured from the best mahogany, French polished, and have double bellows, vertical shifting front, the V-shaped wooden guide, telescopic platform, and Lever Focusing Attachment, by which the most delicate focus can be adjusted with the utmost facility and ease.

No.	Size.		With Double Swing-back.
5	8x10 ins.,	with platform 30 in. long	$38 00
6	10x12 "	" " 36 "	48 00
7	11x14 "	extension " 48 " and vertical shifting front	64 00
8	12x15 "	" " 48 " do	72 00
9	14x17 "	" " 60 " do	76 00
10	16x20 "	" " 65 " do	88 00
11	17x20 ins.,	extension platform 65 in. long and vertical shifting front	$90 00
12	18x22 "	" " 70 " do	100 00
13	20x24 "	" " 72 " do	110 00
14	22x27 "	" " 72 " do	130 00
15	25x30 "	" " 80 " do	170 00

Prosch Triplex Shutters

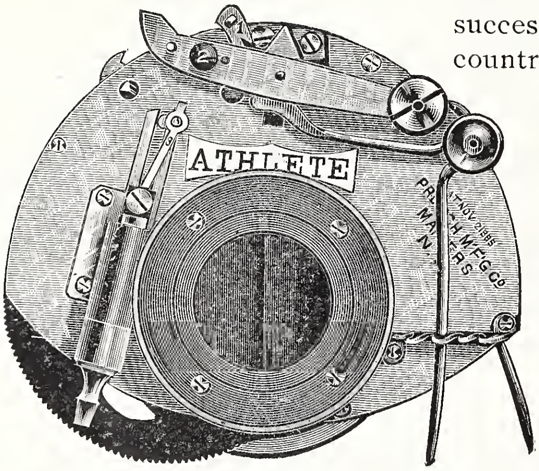


PATENTED.

are found on the best first-class outfits, because the best workers know that the modern anastigmat lenses cannot work at their best without them. For equal times of exposure the Triplex admits more light than any other shutter. It is admitted to be the "fastest" shutter, and also does time and slower instantaneous work. There being no delicate concealed mechanism it keeps in repair.

ATHLETE SHUTTERS

are the only shutters for *Speed Work* placed at the diaphragm. Built like the Triplex, but with twice its speed. Also does time and ordinary instantaneous work. It is used by all the successful newspaper and race-track photographers in the country.



PROSCH STORAGE FLASH LAMPS.

Lightning (SMALL SIZE), -	$4.50
Professional (LARGE SIZE),	9.00

DUPLEX STEREOPTICON, oxy-hydrogen, with low pressure key and valves, and ¼ size Darlot lenses. **Price, $110.**

UNOPLEX MAGIC LANTERN, with 4-wick Oil Lamp, ¼ size Darlot lens, - - - - - - - - **Price, $50.**

SEND FOR CATALOGUE.

PROSCH MANUFACTURING CO.,
389 Broome Street, New York.

Actien-Gesellschaft für Anilin Fabrikation, Photographic Department

BERLIN, S. O.

A. G. F. A.

THE DEVELOPERS:

Eikonogen-Agfa,
Rodinal-Agfa,
Amidol-Agfa,
Diogen-Agfa,
Diphenal-Agfa.

Sold by all Dealers. ⁂ Ask your Dealer for Formulae.

When purchasing a Developer please be particular to specify **Schering's** the oldest and most favorably known brand.

Put up with labels and seals as per fac-similes here given.

E. SCHERING, BERLIN. TRADE=MARK.
REGISTERED.

ONE OUNCE
PYROGALLIC ACID
RESUBLIMED
From E. SCHERING,
MANUFACTURING CHEMIST, BERLIN, GERMANY.

E. SCHERING, BERLIN. TRADE=MARK.
REGISTERED.

THE STANDARD OF THE LAST—THIRD—EDITION OF THE GERMAN PHARMACOPŒIA.

See that you get the Genuine "Schering's." Excelled by none

Send Orders to your Dealers, or to

THE SCOVILL & ADAMS COMPANY OF NEW YORK.

Remember

THAT

"Three Crown"

Albumen Paper

Is absolutely the BEST.

WHY?

Because none but the Best of the Rives Paper is selected for Albumenizing the THREE CROWN BRAND.

It is therefore free from the imperfections often to be found in other brands, which arise from defects in the plain paper, and hence cannot be avoided.

The Highest Artistic Results

ARE PRODUCED WITH THE

Voigtlander

LENSES

PORTRAIT

- - AND - -

Euryscope

: : THE NEW : : :

Collinear Lens yields the most perfect results; speed, depth and flatness of field being unsurpassed. . . .

Also The Genuine **DARLOT LENSES** for all kinds of work, including . . . . STEREOPTICONS, are still to the fore.

All for sale by Dealers and the Sole American Agents:

BENJ. FRENCH & CO., - - Boston, Mass.

THERE is only one genuine——

Platinotype Paper

which gives the art effects that Modern Photography demands —the Willis & Clements paper.

AA, thin smooth; BB, heavy smooth, and CC, heavy rough.

Rembrandt mounts (patented) and Platinotype Paper.

Send for Illustrated Pamphlet.

WILLIS & CLEMENTS,

1624 CHESTNUT STREET, PHILADELPHIA.

A. M. COLLINS
MANUFACTURING COMPANY
No. 527 ARCH STREET
PHILADELPHIA

MAKERS OF
ALL KINDS OF CARDS AND CARD BOARDS
REQUIRED FOR
MOUNTING PHOTOGRAPHS.

A BEAUTIFUL Photograph requires a beautiful Mount to do it justice. If the Mount is poor, the beauty of the picture is half wasted.

The Photograph Mounts manufactured by this house are noted for their remarkable beauty of surface, of coloring, and of finish, and for the exquisite delicacy with which the embossing of imprints is done.

In quality they are unsurpassed by the product of any house, American or foreign; yet the prices are always moderate.

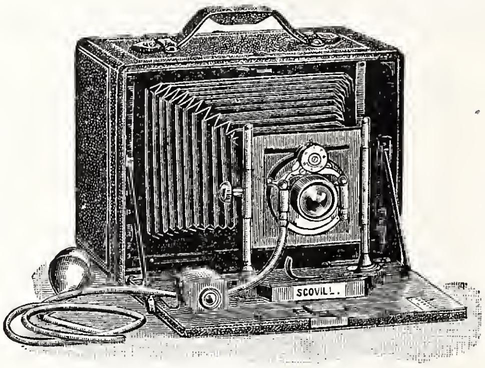
These Standard Goods are sold by Dealers in Photographic Supplies everywhere

The New Photography

For the Army of Enthusiastic Amateur Photographers (long since past the button pressing stage) we have prepared

"Photographic Advice"

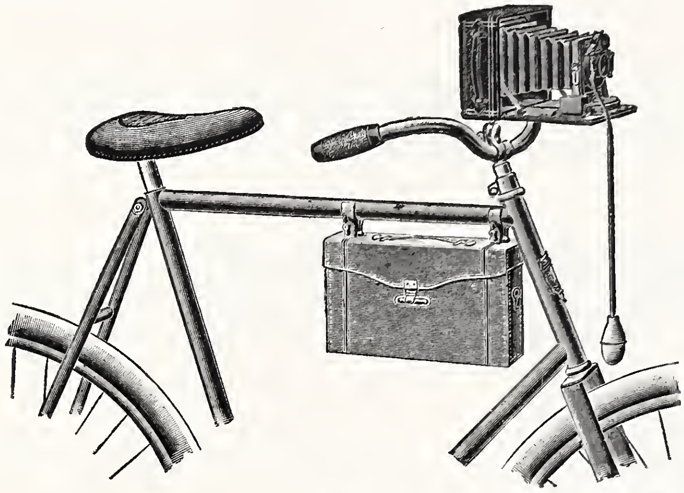
Handsomely Illustrated Manual, sent post free on receipt of ten cents in postage stamps.



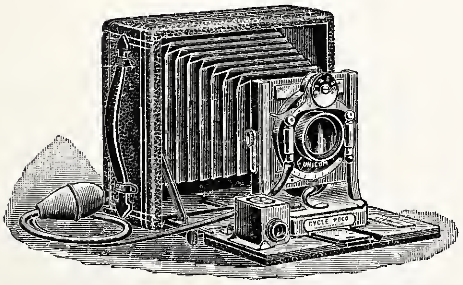
THE SOLOGRAPH CAMERA

The latest and most practical instrument for the discriminating amateur.

The Scovill & Adams Company
OF NEW YORK
60 and 62 East Eleventh Street
(Five Doors from Broadway)



CAMERA PERFECTION



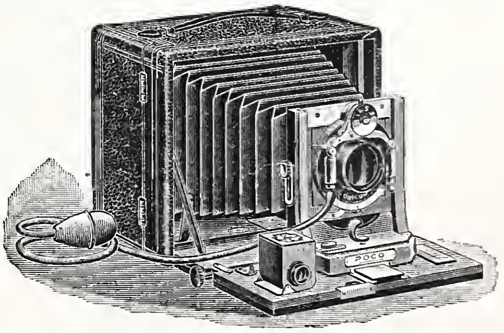
Cycle Poco.

is reached only through perfect workmanship and the perfection of details.

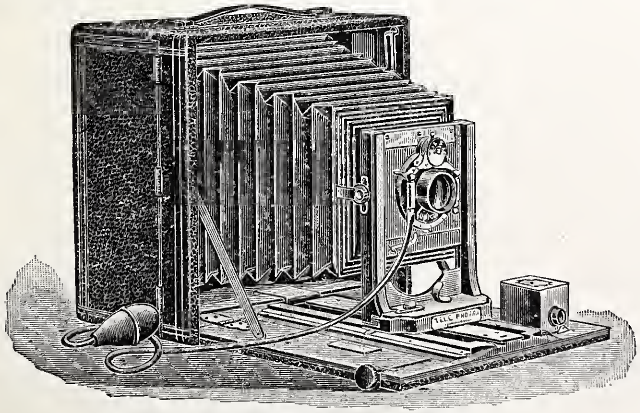
POCOS ARE PERFECT.

There's only one grade of Poco workmanship: the best, whatever the price.

No Camera equals the Poco, because none is built like it. No Camera is as cheap as the Poco, because none gives the purchaser so much for so little.



Folding Poco.



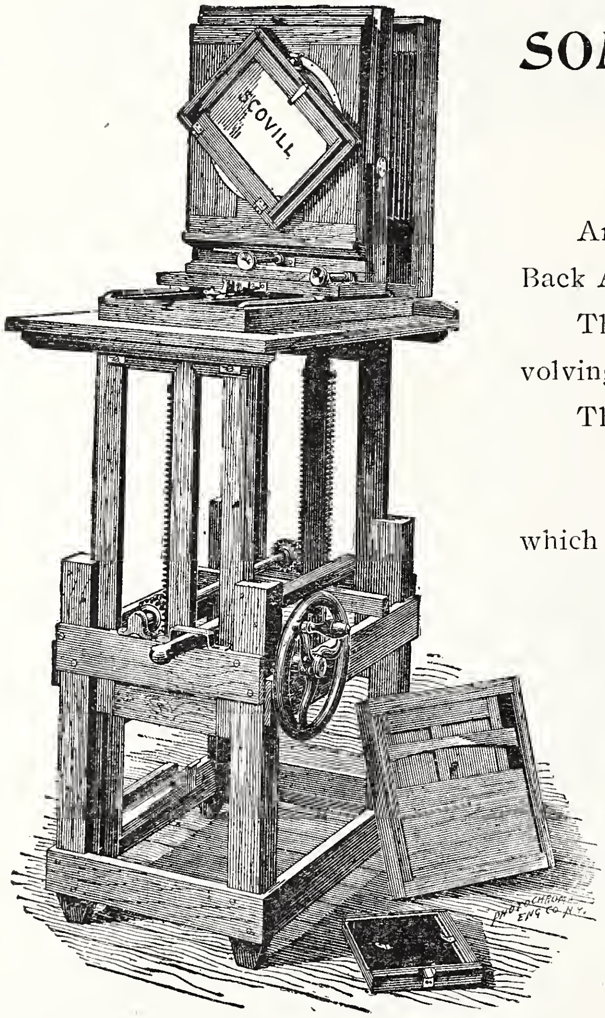
Telephoto Cycle Poco.

Cycle Pocos, Folding Pocos, Telephoto Pocos or Gem Pocos: quality and workmanship remain the same.

ASK FOR POCO BOOK.

Rochester Camera Co.,
66 Elizabeth Street,
ROCHESTER, N. Y., U. S. A.

The Empire Portrait Outfit



SOMETHING NEW
For the Gallery.

An 8 x 10 Portrait Camera, fitted with a Revolving Back Adjuster for 5 x 7 plates.

The position of the plate is changed by simply revolving the turn table of the adjuster.

The outfit comprises also an

Empire Camera Stand

which description we give as follows:

Highest Point from Platform to Floor, ...	**41 Inches.**
Lowest Point from Platform to Floor, ...	**26 "**
Width of Platform, ...	**18 "**
Length of Platform, . . .	**30 "**

THE elevating is done by turning a handled wheel at the side of the stand; the gearing from this connects with the front and rear platform support, causing the platform to rise or fall according to which way the handle is turned.

All the back of the stand is a lever, which, when pressed to the right, throws the gear wheel in front out of gear, and locks the front platform support. On turning the handled wheel from you, the back of the platform is raised, giving the platform an inclination forward of about 15 degrees. By pressing the lever arm to the left the front gear is again placed in position, and upon turning the handled wheel from you, the platform may be raised without disturbing the dip of the platform. If the handled wheel is turned toward you, the platform will be lowered without disturbing the dip of the platform.

Price of Equipment complete, ... $45.00.

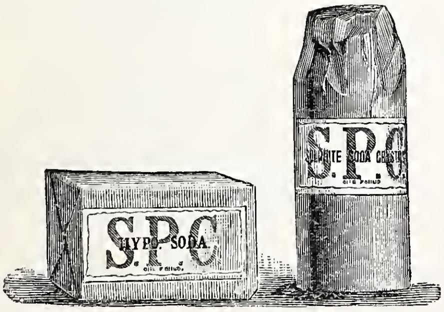
For Sale by all Dealers, and...

THE SCOVILL & ADAMS CO. OF N. Y.,
60 and 62 East 11th Street, NEW YORK.

Beware of Cheap Chemicals and Developers.

INSIST ON HAVING THE BRAND

S. P. C.


S.P.C.
SULPHITE SODA CRYSTALS
S.P.C.
HYPO SODA

(Taken on a Carbutt Orthochromatic Plate,
By Alois Beer, Photographer to Emperor of Austria.)

To obtain Artistic Results,

Carbutt

Non-Halation and
Orthochromatic Plates

Should be Used.

Also J. C. DEVELOPING TABLETS,
Put up in 3 sizes; Price, 25c., 40c., 75c.

STANDARD
FOR
TWENTY
YEARS.

Films — Films

EUREKA
RIBBON FILMS

NEGATIVE AND POSITIVE.

For all Makes of

Chronophotographic
Cameras and
Projecting
Machines

SEND FOR CIRCULARS.

FOR SALE BY ALL DEALERS

CARBUTT

SEND FOR CIRCULARS

FILMS
(CUT SIZES)
PLAIN and
ORTHOCHROMATIC

LANTERN
PLATES

UNRIVALLED
FOR MAKING
Lantern Transparencies

SPECIALTIES:

Color Screens
Sizes 2½x2½ and 3½x3½.

Color Screens
For Photochromic Process.
Sets only. Sizes 2½ x 2½ and 3½ x 3½.

Multum-in-Parvo Lantern

Lantern Slide Mats

Lantern Slide Binders

Thin Crystal Cover Glass.

Developers.

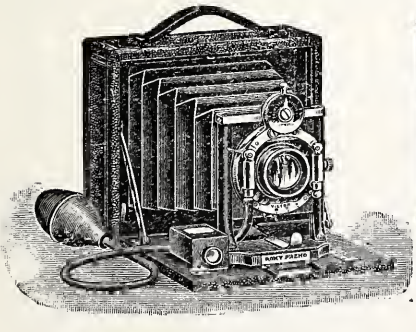
PLATES

ECLIPSE
ECLIPSE JUNIOR
Orthochromatic 23 x 27
NON-HALATION
B 16
X-RAY PLATES
Transparency Plates
(Plain or on Ground Glass)
LANTERN PLATES
STRIPPING PLATES
HALF-TONE PROCESS

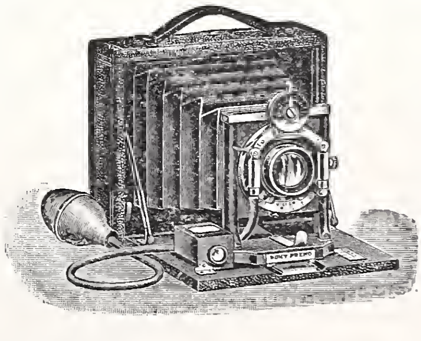
JOHN CARBUTT, KEYSTONE DRY PLATE AND FILM WORKS, **WAYNE JUNCTION, PHILADELPHIA.**

Premo Cameras $5. to . . $50.

Are the standard. If you purchase a Premo, you will know you have the latest and best, and will agree with us that . . . .



PREMOS
PRODUCE
PERFECT
PICTURES.



Send for Illustrated Catalogue.

Rochester Optical Co.

ROCHESTER, N. Y.

LIFE IS TOO SHORT

to bother with slow, tedious, and difficult printing processes. That's why you should use our Velox papers. They can be used at any time, day or night.

It takes an INCREDIBLY SHORT TIME for turning out LOTS of prints.

No process so Easy and Simple gives such ARTISTIC AND PERMANENT RESULTS.

Sample Packages of two dozen Cabinets, or 4 x 5, two Sample, Prints and Developer, will be sent on receipt of 50 cents.

We manufacture ALL KINDS of Photographic Papers, Gelatine, Collodion, Matt, Glossy, Bromide, etc., and

Our Record has given us an enviable reputation throughout the whole world.

NEPERA CHEMICAL CO.,

Works and Head Office, Nepera Park, N. Y.

BRANCH OFFICES:

Chicago, Ill., Atlas Block, 35-37 E. Randolph St.
Paris, France, 159 Faub. Poissonniere.

Order from your dealer, and if he does not fill your order, we WILL

PHOTOGRAPHIC MATERIAL M'F'R'S.
R M W Co.
ROCHESTER N.Y. U.S.A.

WE LEAD!

•• Carbon and Platinotypes Outdone ••

TWO NEW PRODUCTS OF VALUE.

Velutype

and

Gravure Board.

Printing Out Processes.

NEW EFFECTS. SIMPLE. PERMANENT.

They will improve your Business and Prices.
Send for Information.

Reichenbach, Morey & Will Co.

Rochester, N. Y.

Makers of Vera, Vera Matte, Victor, and Cameras.

Use the Hammer = =

Dry Plates

ABSOLUTELY

Uniform and Clean.

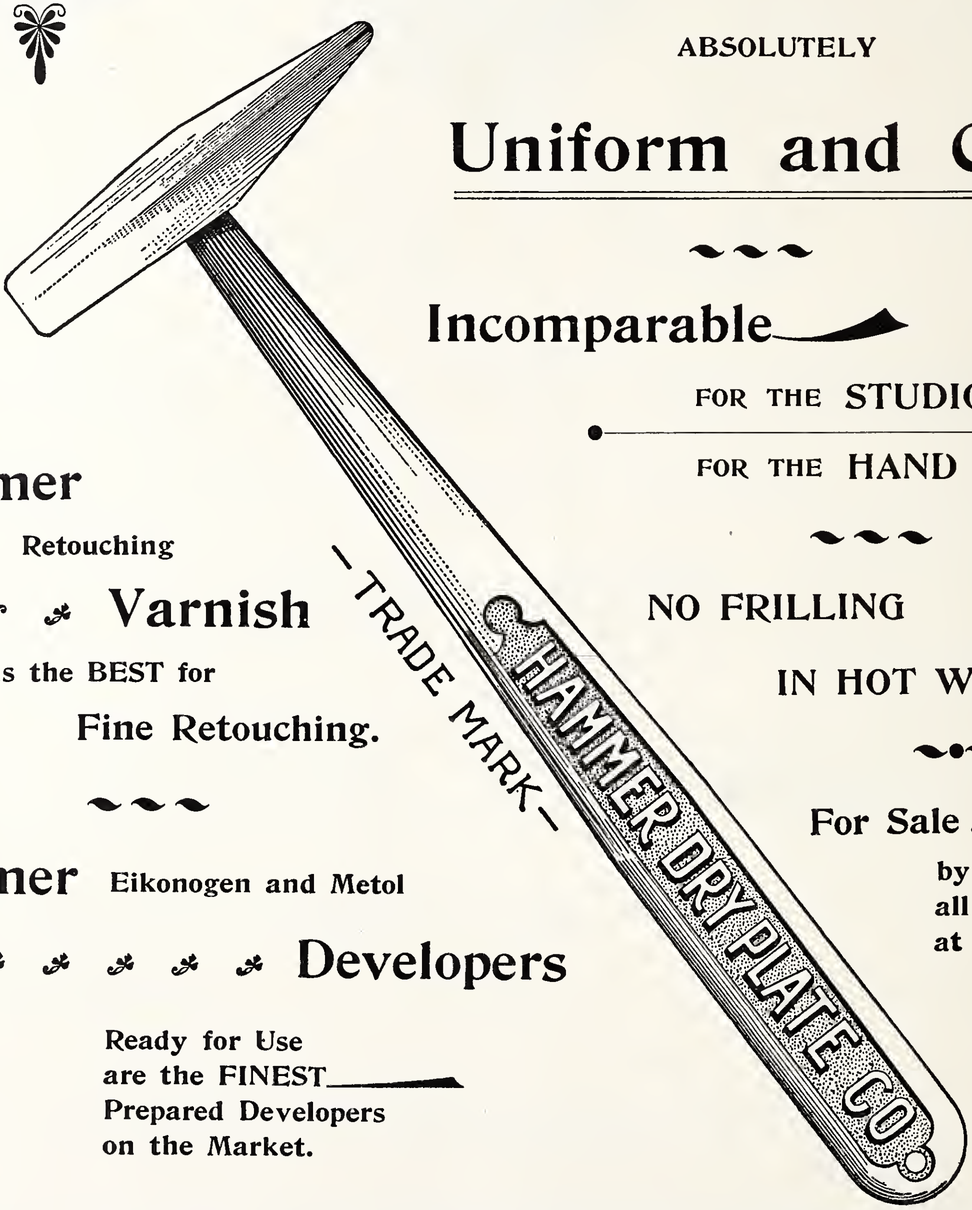
Incomparable

FOR THE STUDIO,

FOR THE HAND CAMERA.

NO FRILLING

IN HOT WEATHER.



Hammer
Retouching
Varnish
is the BEST for
Fine Retouching.

Hammer Eikonogen and Metol
Developers

Ready for Use
are the FINEST
Prepared Developers
on the Market.

For Sale ....
by
all Dealers
at
Popular
Prices.

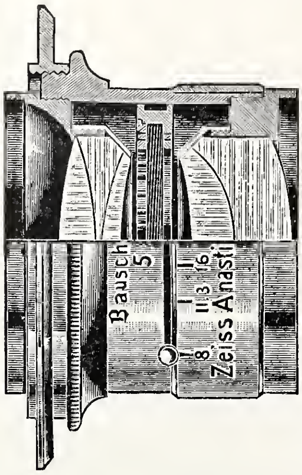
Send for Hammer's "Little Book" a short talk on negative making, mailed free to any address.

MANUFACTURED BY

Hammer Dry Plate Co.,

ST. LOUIS, MO.

THE SCOVILL & ADAMS CO. OF N. Y., EASTERN TRADE AGENTS.



Series

II^{a}

**Bausch & Lomb
Zeiss
Anastigmat Lenses**

ARE RECOGNIZED AS THE

Best Hand Camera Lenses

made. They have all the desirable qualities of an ideal lens.

GREAT SPEED, DEPTH OF FOCUS, COVERING POWER, and ENTIRE FREEDOM FROM ASTIGMATISM.

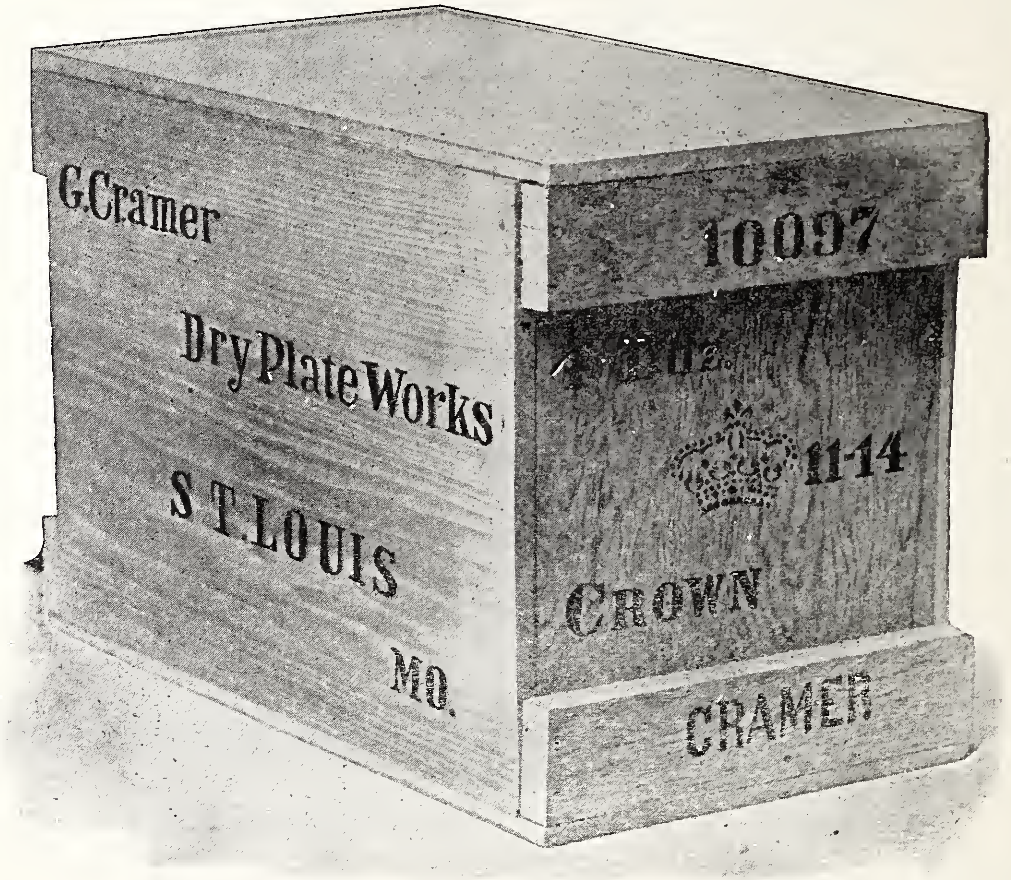
The mountings are extremely compact and the lens systems are sufficiently separated to permit the fitting of the Iris Diaphragm or Unicum Shutter between them.

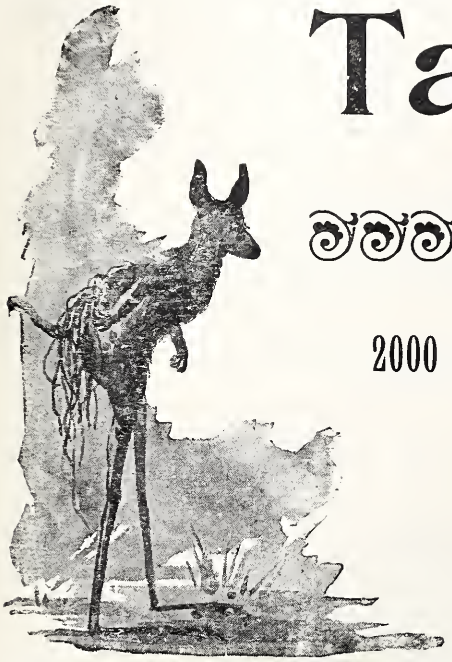
THESE LENSES ARE SUPPLIED, IF DESIRED, BY ALL MAKERS OF HAND CAMERAS, OR BY THE

Bausch & Lomb Optical Co.

524½ N. St. Paul St., Rochester, N. Y.

Branches :
NEW YORK CITY. CHICAGO, ILL.


G.Cramer
Dry Plate Works
ST.LOUIS
MO.
10097
11·14
CROWN
CRAMER



Tapestry Paintings

2000 Tapestry Paintings to Choose from, 38 Artists employed, including gold medalists of the Paris Salon.

When in New York don't fail to call and see these Tapestries. We shall be pleased to show them to you!

Artistic Home Decorations.

We can show you effects **never** before thought of, and at moderate prices, too.

Why have your house decorated and painted by inferior workmen, when you can have it done by skilled workmen—by Artists—for the same price?

If you intend Decorating, if only one room, call or send to see what we are doing, and for whom. Write for our color schemes, designs, estimates. Artists sent to all parts of the world to do every sort of decorating and painting. We are educating the country to color harmony. Relief, stained glass, wall paper, carpets, furniture, draperies, etc. Pupils taught. Write us for a color scheme to decorate your home.

Wall Papers. New styles, designed by gold medal artists, from 10 cents per roll up. Send 50 cents to prepay expressage on large sample books and will include drapery samples in package. See our Antique Metalic, French, Pressed Silks and Lida effects in special colors to match all kinds of wood work, carpets, and draperies. Have 500 different wall hangings with draperies specially made to match.

Draperies. We have Draperies to match all wall papers from 15 cents a yard. This is a very important feature to attain the acme of artistic excellence in decoration. No matter how much or how little you want to spend you must have harmony of form and colorings. Write us for samples. Special Silk Draperies made at our Broomhead Mills, Paterson, N. J. Encourage Home Industry! Write us for samples.

Decorative Advice. Upon receipt of $1, Mr. Douthitt will answer any question on interior decorations—color-harmony and harmony of form, harmony of wall coverings, carpets, curtains, tiles, furniture, gas fixtures, etc.

Manual of Art Decorations. The art book of the century, 200 royal quarto pages, filled with full-page colored illustrations of modern home interiors and tapestry studies. Price $2. If you want to be up in decoration send $2 for this book; worth $50.

School. Six 3 hour tapestry painting lessons, in studio, $5. Complete written instructions by mail, $1 Tapestry paintings rented; full-size drawings, paints, brushes, etc., supplied. Nowhere, Paris not excepted, are such advantages offered pupils. New catalogue of 125 studies, 25 cents. Send $1 for complete instructions in tapestry painting and compendium of 140 studies.

Tapestry Materials. We manufacture tapestry materials superior to foreign goods and half the price. Book of samples, 10 cents. Send $1.50 for 2 yards No. 6,50-inch goods, just for a trial order; worth $3.

The Goddess of Atvatabar. A trip to the interior world. "Jules Verne in his happiest days outdone." 318 octavo pages, 44 illustrations, price $2, postage prepaid. Paper covers 50 cents. All kinds of draperies to match all sorts of Wall Papers, from 10 cents per yard up. **This is our Great Specialty.**

Goblin Printed Burlaps. Over 100 new styles for wall coverings, at 25 cents per yard, 35 inches wide, thus costing the same as wall paper at $1 per roll. 240 kinds of Japanese lida leather papers, at $2 per roll.

Goblin Art Drapery. Grecian, Russian, Venetian, Brazilian, Roman, Rococo, Dresden, Festoon, College Stripe, Marie Antoinette, Indian, Calcutta, Bombay, Delft, Soudan.

In order that we may introduce this line of New Art Goods, we will send one yard each of 50 different kinds of our most choice Patterns for $7.50.

JOHN F. DOUTHITT

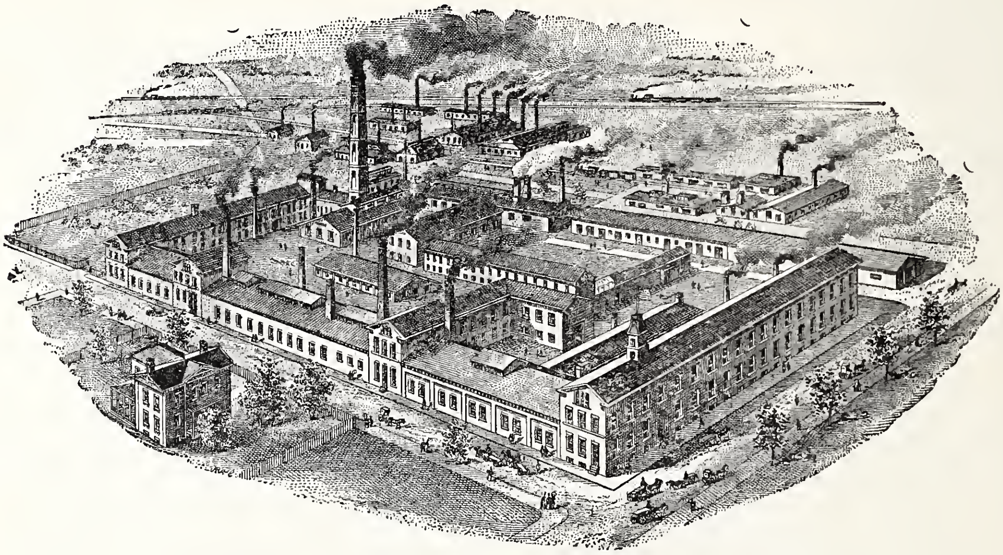
American Tapestry Decorative Company,

286 Fifth Avenue, New York, Near 30th Street.

CHAS. COOPER & CO. ESTABLISHED 1857.

Manufacturing Chemists and Importers,

194 WORTH STREET,
NEW YORK.



WORKS AT NEWARK, NEW JERSEY.

Chemically Pure Photo Chemicals.

NITRATE SILVER, CHEMICALLY PURE CHLORIDE GOLD,
SULPHITE SODA CRYSTALS AND GRANULAR. : : : : :
: : LITMUS PAPER, ACID SULPHITE SODA SOLUTION,
COMMERCIAL AND CHEMICALLY PURE ACIDS, ETHERS
AQUA AMMONIA, SOLUBLE COTTON FOR COLLODION PAPER.

We Manufacture a full line of Chemicals,
Medicinal, and for the Arts and Technical purposes.

Bromo-Oxygen, a most efficient disinfectant and deodorizer.
Can be diluted with 32 parts of water.

MONTHLY PRICE LIST ISSUED. REFINERS OF PHOTO SILVER AND GOLD WASTE.

KINDLY MENTION THE PHOTOGRAPHIC TIMES.

The Scovill & Adams Company
Of New York

ARE MANUFACTURERS AND IMPORTERS OF AND
....DEALERS IN....

AN UNEQUALED VARIETY OF

PHOTOGRAPHIC GOODS

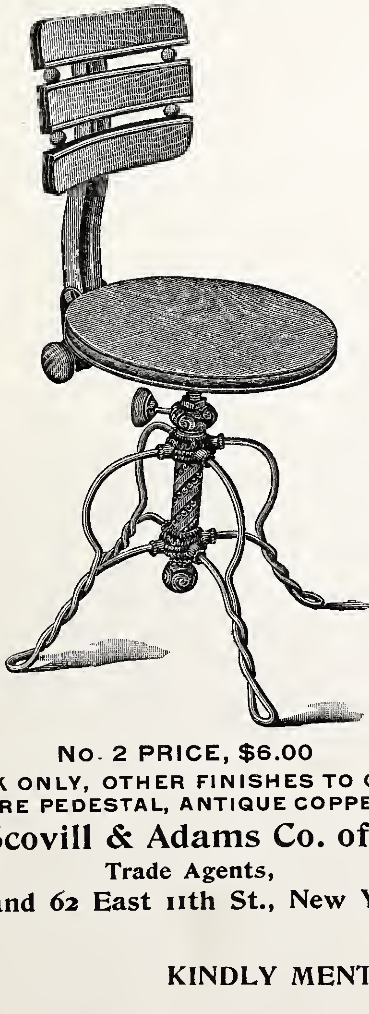
Embracing every Requisite of the Practical Photographer.

THE LARGEST AND OLDEST PHOTOGRAPHIC ESTABLISHMENT IN THE COUNTRY.

The Scovill & Adams Co. of N. Y.
60 and 62 E. 11th St., New York, U. S. A.

W. I. LINCOLN ADAMS, Pres't and Treas. - - H. L. HOLMES, Sec'y.
A. C. LAMOUTTE, Vice-Pres't. - - - HENRY SCOTT, Ass't Sec'y.

Photographer's Chair
Indestructible

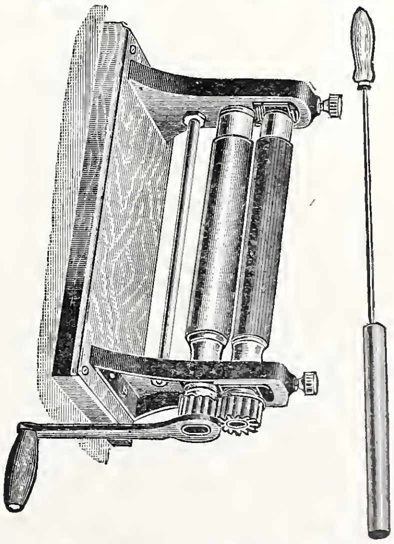


No. 2 PRICE, $6.00
IN OAK ONLY, OTHER FINISHES TO ORDER.
STEEL WIRE PEDESTAL, ANTIQUE COPPER FINISH
The Scovill & Adams Co. of N. Y.
Trade Agents,
60 and 62 East 11th St., New York.

SUNSHINE BURNISHER!
(Patent Pending.)

The Burnisher is heated by an iron, which is slipped into lower roller. It will burnish 20 or 25 photos with one heating.

$5.00



$5.00

No Danger or Expense by using Oil, Gas, or Gasoline. Will burnish up to 6½ inches,

Your Order Solicited By
The Scovill & Adams Co. of N. Y.,
60 and 62 East 11th St.,
New York.

THE NEW TRIUMVIRATE

FOR 1898

HENRY CLAY

KLONDIKE

SOLOGRAPH

Scovill high grade
CAMERAS
at popular prices

KLONDIKE, PRICE $5.

Send for description of these Cameras.

SOLOGRAPH 4 x 5, PRICE $35.

HENRY CLAY PRICE $85.

THE SCOVILL & ADAMS CO. OF N. Y.

60 and 62 East 11th Street, New York.

FLASH-LIGHT PHOTOGRAPHY
With the
BYRON LAMP.
See article in April Number of Photographic Times.

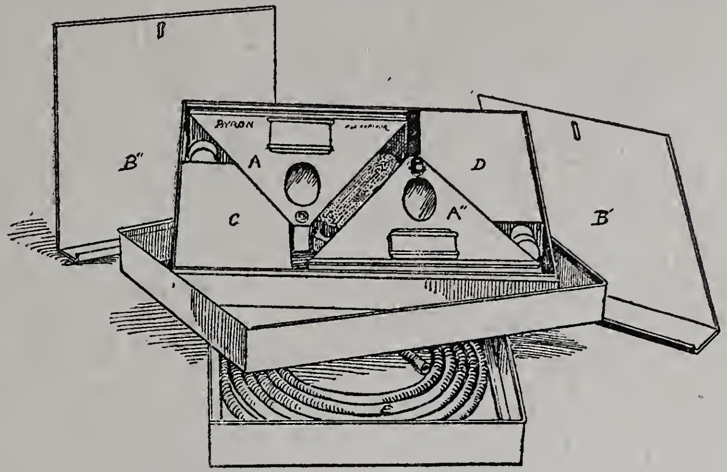


FIG. 1.—A′ A″ LAMP IN CASE. B′ B″ REFLECTOR TO SLIDE IN GROOVE BACK OF LAMP. C FLASK FOR MAGNESIUM. D FLASK FOR ALCOHOL. E RUBBER TUBES.

FIG. 4.—SHOWING METHOD OF USING THE "DOUBLE BYRON" LAMP.

Combines with daylight for artistic illumination.

Better than daylight.

Price $8.00 per pair of lamps. For Sale by
THE SCOVILL & ADAMS CO. OF N. Y., 60 and 62 East 11th Street.

THE EMBLEM

OF

PERMANENCY!

ARISTO.

TRADE MARK

EIGHT YEARS' RECORD
HAS PROVEN IT SO.

The
Best printing-out papers, Aristo Platino, Aristo Jr., and Aristo Blue Label,
All Pure Collodion.

Manufacturers:
American Aristotype Co.,
Jamestown, N. Y.

Trade Agents:
E. & H. T. Anthony & Co.,
New York and Chicago.